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SOME IDEAS CONCERNING BIOLOGICAL HEREDITY[1].

HITHERTO the theories of heredity most discussed by biologists have been those of Darwin and Weismann. To these might be added the hypotheses of Spencer and Galton.[2] Galton's hypothesis is a modification of Darwin's theory of Pangenesis, and is at the same time an approach to the theory of Weismann, for Galton antedates Weismann in maintaining the non-inheritance of acquired characters.

On re-examining the theories above mentioned, I was reminded of the hypothesis of Leibnitz, who, in his endeavor to explain the conception of original sin (which according to the Christian faith is transmitted from father to son), as a degenerate condition of the human soul which therefore has need of redemption to free itself from it, had recourse to the hypothesis that souls are contained in the seed from Adam down; that therefore there has been no new creation of souls from the beginning, because Adam contained all that were to be born and united with their future bodies by means of a pre-established harmony.

No philosopher after Leibnitz accepted this theory because it

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[1] Translated from the MS. of Prof. Giuseppe Sergi, of the University of Rome, Italy, by I. W. Howerth, Ph. D., of the University of Chicago.

[2] Spencer, *Principles of Biology*, Vol. I.; Darwin, *The Variation of Animals and Plants, under Domestication*, Chap. 27; Galton, "The Theory of Heredity," *Journal of Anthropological Institute*, Vol. V., 1876; Weismann, *Essais sur l'hérédité et la sélection*, Paris, 1892. Cf. Romanes, *An Examination of Weismannism*, Chicago, 1893; also his *Darwin and After Darwin*, Chicago, 1897.

does not seem rational. It appears to me, however, that the theories of heredity, especially the latest and the one most discussed, namely, that of Weismann, bear a strong resemblance to the Leibnitzian. For the germ plasm, like the stirps of Galton, is also supposed to have been contained in the primal ancestor, is equally immortal, like the soul of the spiritualist, and descends through the sexual cells, which are "the seed" of Leibnitz. The metaphysics is complete, and Galton himself is constrained to admit that it is necessary to theorise.[1] I shall not here enter into an extended discussion of the various theories of heredity proposed by Darwin and Weismann and by the opponents of the latter, because it would lead me beyond the limits of this paper. Since, however, from Darwin to Weismann there have arisen supporters and adversaries of the two principal hypotheses of evolution, the Darwinian and the Lamarckian, which are closely connected with heredity, I may say a word bearing upon the latter subject.

The gemmules of Darwin are derived from the cells which compose a multicellular organism, and are collected in the reproductive glands to form the two sexual elements from which a new organism is derived. It is not said that these gemmules, that is, the ovules and the spermatozoa, are immortal and in every organism substantially the same as in the parent organism; but it is said that they may be transmitted without having undergone any change to distant descendants where they may develop and produce the phenomenon of atavism.

So Darwin, while attempting to explain the appearance of atavistic forms, presented an hypothesis upon the heredity of specific forms. At the same time, he had to reconcile the persistence of such forms with the variations which are indispensable to explain the origin of species under the influence of natural selection. Darwin was, therefore, in a certain sense Lamarckian, because he admitted the influence of the environment upon the organism, and the effects of the use and disuse of organs.

The idea of the stability of these gemmules is still more ob-

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[1] "We are therefore forced to theorise." *Op. cit.*, p. 335.

vious in the theory of Galton, who called them "stirps," to which he attributed continuity, as does Weismann to germ-plasm. Galton declared emphatically that the stirps are only slightly subject to variation, and he opposed the validity of the theory of external action in heredity. That is to say, he admitted the nontransmissibility of acquired characters, except in a very few cases.

Weismann is the uncompromising advocate of the theory of the unaltered continuity of the germ-plasm, which, according to him, descends unvaried from generation to generation, and hence also of the nontransmissibility of acquired characters. Really I ought not to say that Weismann is a rigid supporter of his own doctrine, for he has modified it many times and has finally conceded that sometimes the hereditary transmission of acquired characters takes place. Now I wish to consider a certain phase of Weismannism, which is still in vogue in Italy and elsewhere, in order to show that it is theoretically untenable, and it is only theoretically that it is maintained, in so far as it regards the origin of variation in relation to natural selection. I shall endeavor to do this, because up to the present time no biologist has considered it in the same light.

Since the germ-plasm of Weismann is not subject to any influence, and only the somatic cells may undergo variation, it is natural that no individual variation may be transmitted by heredity. But the fact of variations exists, and it cannot be denied that there are transmissible or transmitted variations without forestalling ourselves from speaking of the origin of species, of selection, etc. Hence Weismann, constrained by the nature of the facts, admitted from the first that transmissible variations are only those which are produced in unicellular organisms, for he believed that the germ-plasm occupied the whole cellular substance which, therefore, could be directly modified by external influences. It might be said that Weismann was a Lamarckian only as regards unicellular organisms. But when a substantial distinction was made between the nucleus and the content of the cell, Weismann could no longer maintain this position, and the question of the possibility of hereditary variations even in unicellular organisms was raised.

There is only a single means, according to Weismann, whereby hereditary individual differences could take place, and that is sexual reproduction or amphigony. "It is well known that this process consists," he says, "in the coalescence of two distinct germ-cells, or perhaps only of their nuclei. These germ-cells contain the substance, the germ-plasm, and this again, owing to its specific molecular structure, is the bearer of the hereditary tendencies of the organism from which the germ-cell has been derived. In this amphigonic reproduction two groups of hereditary tendencies are as it were combined. I regard this combination as the cause of hereditary individual characters, and I believe that the production of such characters is the true significance of amphigonic reproduction. The object of this process is to create those individual differences which form the material out of which natural selection produces new species."[1]

Conceding to Weismann this proposition, we must ask him how it happens that in the two sexes, or better, in the two sexual cells, the variation of the germ-plasm is produced. For we must admit that the ovule and the sperm-cell contain like elements, being derived from organisms which had no original sexual differences, and that the variation in the ovule or the sperm cell did not constitute a variation in the germ-plasm which is found in the nucleus and is derived from an asexual organism. But Weismann does not answer this question. On the contrary, he supposes these conditions as an original fact.

Now, it seems clear to me that the origin of sex must not be sought in the germ cells, for these depend principally upon conditions external to the cells themselves, that is to say, upon particular conditions of the parent and of nutrition. Hence, if no variation in the germ-plasm is found at the beginning, none can ever be found, and the two cells, the ovule and the sperm cell, must have like germ-plasm, because, according to Weismann, they cannot undergo any alteration from the influence of the somatic cells. The mixing in sexual reproduction, then, cannot be the cause of heredi-

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[1] *Essais cit.*, p. 320.

tary individual variation no matter how great the number of successive generations.

Suppose, with Weismann, that the variations of the germ-plasm had originated in the unicellular organisms in the manner which he at first believed, that is, by the direct action of external causes. Still we could not admit that the multicellular organisms derived from them would have carried the variations acquired in the germ-plasm, and would have originated the innumerable variations which are found in the species. Such variations of unicellular organisms would have been limited, and would not have been able to produce all these effects, because as soon as unicellular organisms became multicellular they would have lost the condition of being able to undergo modifications through external influences, and would have been arrested at the first or most elementary variations already acquired in the unicellular condition. That is to say, there could not have been produced the innumerable species of animals and plants which now exist, and no natural selection could have been exercised.

Weismann, then, abandons even the possibility of variation in unicellular organisms. Since the germ-plasm is contained only in the nucleus, the way is closed, according to his own theory, to any variation even in these organisms. Even when unicellular organisms reproduce by amphigony they could only carry an unvarying and invariable plasma.

We may ask, then, How has it been possible that such a theory as that of Weismann could have attracted so much attention from the biologists of every country? I confess that it astonishes me to see it maintained by eminent zoölogists and naturalists of every sort, and so long discussed.[1]

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Turning now to the general conception of the hypotheses concerning heredity, I believe I can explain why it is that a substance called gemmule, stirp, idioplasm, and said to be immortal, unvaried and more or less invariable, is supposed to exist. It is doubtless

[1] Cf. Romanes, *op. cit.*

the desire to find a basis for the fact of the conservation of forms in species and, in general, in the types of living beings of the two organic kingdoms, animal and vegetable. It is thought that without such a special substratum, separate, according to the theory of Weismann, from every other vital element, there could not be any stability of living forms. And since the variation in individuals is continuous and hence visible in every case, there has not been allowed to such variations the importance and the influence upon the reproduction of forms that they merit. Variations through external action resemble planetary perturbations, which are not capable of throwing a celestial body out of the orbit in which it is held invariably and eternally by virtue of the attraction of a greater body.

But this is a philosophic speculation, and represents the tendency of almost every thinker to seek for the occult and the mysterious. As I have already said, it seems to me that, from Darwin to Weismann, the hypotheses on heredity, multiplied in a few years, are analogous to that of Leibnitz concerning a pre-established harmony and the transmission of souls by means of reproduction, all of which souls being supposed to have been created at one time and no more afterwards, for no more were necessary. It is true that the gemmules and the germ-plasm are multiplied by division, but, according to Weismann, it is always the same substance, hence immortal. He attributes immortality to unicellular organisms.

The same speculation and the same hypothesis should be valuable even in another kingdom which has forms more definite and more stable than the animal or vegetable kingdom, namely, the mineral. Why not assume a special substratum for the production of mineral crystals as well as for the production of animal types?

Now, I ask, Why not seek a foundation for the stability of the reproduction of living forms which is simpler in its characters and more natural? Why recur to the hypothesis of an occult substance with occult qualities? Casual observation reveals in nature and in all its manifestations a tendency to stability, a perennial conservation in all its manifestations and energies, like the inertia of bodies

or the unaltered continuity of the laws of nature, which, while they may seem transitory, appear as constant phenomena.

To change this natural stability in a single manifestation it is necessary that superior forces act in determinate conditions. For instance, to separate the molecules cohering in a substance there must be a force which is superior to that of cohesion; to dissolve a crystal it is necessary that there be a condition which destroys that which has produced it and conserves it. In spite of the various energies which may disturb the movement of a celestial body it will always move in its orbit with great stability and constancy. So it may be affirmed that the succession of the phenomena of nature is constant in spite of the fact that there are disturbing causes. Chemical combinations, physical phenomena, transformation of energy, all speak of the continuity of natural manifestations.

We do not find it necessary, then, to invent a new alchemy treating of heredity in the two kingdoms of life. Man has had, and has yet, the tendency to occultism, it may be even with a scientific appearance, and to explain the phenomena of life he has invented now a *nisus formativus*, now a vital force, now a psychic, like the simple and immortal soul, now the spirit of the spiritualists, now the immutable and immortal germ-plasm.

The stability and the continuity which exist in all the phenomena of nature ought to reappear in the phenomena of life, which is also one of the phenomena of nature. The constant succession of living forms with the same characters is the most evident demonstration of this stability. In studying the micro-organisms, protophytes, and protozoa, one may observe the constancy of their forms and appearance. This constancy appears in the uninterrupted chain of heredity. If a living being could be born without the existence of another which precedes it, that is, without a parent, there would be no continuity and hence no stability. On the contrary there would be an interruption of the phenomena of law. Hence generation constitutes a continuity in succession, and heredity, a constancy in the reproduction of living forms.

The cell of the most minute and elementary organism is derived from a cell, and, as we know, by division. The formative

element is inclosed in the nucleus, and is that part which contains the energy and the center of vitality. From it there is an expansion of energy which is multiplied by generation, that is, by the cell's dividing itself and collecting in the protoplasmic substances surrounding it new nutritive elements. In such division and multiplication the individual cell cannot produce new individuals different from itself in form and function. In accordance with the stability of nature it produces homogenous individuals. In this phenomenon presented in its elementary form, it is not necessary to create an occult substance, a special plasm which is multiplied and generates new individuals while remaining unvaried and immortal. If anything immortal exists it is the form or the morphological characters of the living being. The living substance which has accumulated energy tends to expand, and is expanded by functioning or by dividing itself through successive generations.

Considering always the generation of a unicellular organism in the manner described, it is easy to understand that the living nuclear substance divided into two new and young individuals must be inferior in quantity and in energy to the mother substance or the generating individual if it is not increased by means of nutrition. But this is what happens, and then the new individual becomes like that from which it is generated, with the same amount of substance and equivalent energy. In this process, yet very simple, the form does not change, there is no condition to change it, and this happens in accordance with the fact noted above in every phenomenon of nature, namely, the conservative stability which constitutes the constancy and continuity of nature.

Whoever will observe closely the individuals of a unicellular type may find in them some variation, either in size or in length of cilia, if they are ciliated, etc. We may say that in their reproduction the type is perfectly conserved and the forms are constantly reproduced, but there is some deviation, which, however, does not in the least alter the type in its essential characters. This deviation constitutes the individual variation of the type.

What are the causes of these individual variations? How does it happen that the perennial constancy of forms may undergo varia-

tions in the succession of generations? Here new forces which are external, also natural, enter into action and exert an influence above that of these organisms, as happens with reference to other substances and forms of nature. We have said that a planet always describes its elliptical orbit around the star which attracts it, in spite of the perturbations which may be produced by other celestial bodies outside of its orbit. The attractive force of the sun is greater than that exerted upon the planet by other bodies. Hence it is held in its orbit. But these other bodies cause the planet to describe a curve irregular at certain points, and so the orbit, while preserving its elliptical form, may become sinuous.

If we consider that various forms of energy external to the living organism may act upon it, we may easily understand that some force may disturb its natural development and so produce a deviation from the parent type. Whatever be the circumstances, they may have their influence. Take, for instance, the ease or difficulty of finding food, its abundance or scarcity. In the minutest organisms this is perhaps one of the commonest conditions producing a variation in the individuals. But the environment in which they are born and are developed may undergo a change. In this manner we may conceive a series of influences which may be favorable or unfavorable to the conservation of the natural persistence of the organisms in their forms and corresponding functions. Thus there may be a condition which will produce a deviation from the type without destroying it, that is, may produce individual variations.

Without going beyond the generation of micro-organisms, in which the reproduction of forms seems simplest and more constant, and easier also to interpret, because we do not yet find in them a complexity of tissues and of organs, we may show, as a manifestation of the natural stability of living forms, some very important and at the same time surprising examples.

We do not know why it is that some protozoa have undergone such changes in reproduction as to acquire the mode of generation by spores. Under such circumstances the developing organism must pass through a series of changes and undergo considerable

transformations before it reaches the form of the type from which it originated. *Colpoda cucullus* (Fig. 1) shows admirably the various phases of development and the various metamorphoses through which the animal, which is an infusorian, passes before acquiring the definitive form. But it finally reaches it. Now, this demonstrates to us how, in spite of a series of deviations in the embryonal stage through which the *colpoda* passes, the typical form reappears constantly as a fact illustrating the persistence and stability of nature. Probably from the beginning external forces have acted with

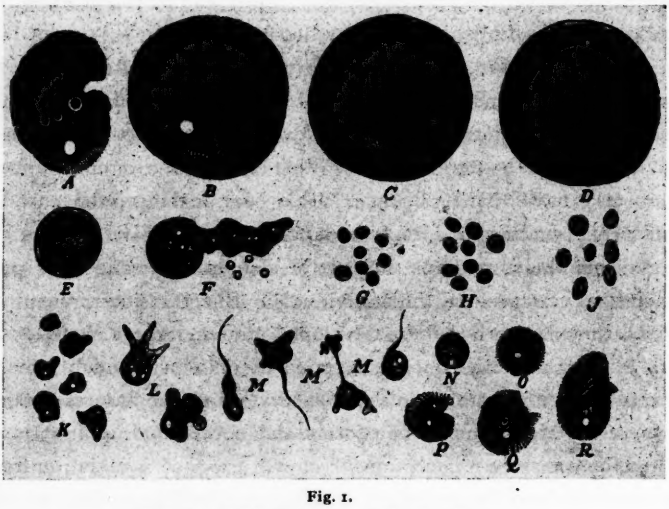

Fig. 1.
Evolution of *Colpoda cucullus*. (After Rumbler.)

great energy upon the micro-organism which assumed the encysted state to pass to generation by division. These causes may have coöperated with the reproductive energy to produce in the interior of the organism a great number of cells which, owing to the conditions in which they were born, could not have the same form as the cell born by division and whose form is complete, and identical to the mother cell. From this fact arises the necessity of freeing the embryonal cells or spores from their imprisonment. And these must undergo various phases of development before completing themselves in the adult form.

Whoever will observe the reproduction and the variations of *colpoda* will wonder why it must pass through so many changes. These changes are indicated in Fig. 1. *A* is the infusorian in its adult and typical form; in *B* it has reached the encysted state; in *C* and *D* there is a reduction of its volume, and the loss of its cilia. In *E* spores have been produced, and *F* represents the rupture of the envelope and the issue of the spores; the transformation of the spores *G* is visible successively in *H*, *J*, *K*, and *L*, in which the growing spore assumes the form of an amœba and then of a flagellata. Finally by degrees the typical form reappears in *R*. One might say that there has been a period of struggle between the natural stability of forms and the deviation determined by extraneous and external causes, but that stability, while undergoing temporary variations in the period of development, has finally conquered.

I have no need to create a germ-plasm with characters special and absolutely distinct from the other plasma which constitutes the body of the animal organism, to explain the reproduction of *colpoda*. Nor shall I be constrained to establish such a germ-plasm for the simple or primordial reproduction which takes place by division. The nuclear substance is sufficient to explain the phenomenon. In simple division there is the production of a new nucleus from the primitive nucleus, as an emanation from the latter, which is augmented by nutritious materials. In the formation of the spores in *colpoda* and other similar micro-organisms, I think we find the same phenomenon with an important variation arising from generative multiplication. That is to say, the nucleus undergoes a greater number of divisions, is protected as to the particles in which it is divided, by nutritive protoplasm and the tegument, in order that they may have time to develop themselves freely and under favorable conditions. Hence the same plasma which constitutes the most active part of the organism is that which is involved in the reproduction and multiplication of the organism itself. The reproduction of the type itself with its own morphological and functional characters, depends, as I have said, upon a natural stability or inertia which never varies unless a greater force acts upon the organism or upon the living substance of the various organisms.

Unless this is the case these organisms reproduce invariably the forms from which they are derived. It may be said, varying the signification, that there exists that fixity of species which the biologists before Darwin considered the effect of the original creation.

The transition from the production of spores to the production of sexual cells, ovule and sperm cell, resembles the transition from nuclear division to the production of spores. When an organism becomes complex and composed of many cells, and these are transformed into different tissues, it is no longer possible to observe cellular division as a means of reproduction, nor the production of spores which occupy and absorb the whole generating substance, as a means of reproductive multiplication. In composite organisms there must naturally and necessarily be a separation of the reproductive substance by another method. And this living reproductive substance must find a place to deposit itself and to await maturity and development.

Now, when we consider the conditions of more evolved animal life, we find two very special secretive organs, the spermatic glands of the male and the ovaries of the female. These two organs, which have also a special structure, are charged with collecting that which serves for the reproduction of the future organism and of forming it into characteristic cells, that is, the egg-cell and the sperm-cell. So a reproductive cell derived from a composite organism, for example, a vertebrate, a bird, a reptile, or a mammal will reproduce one of those types of animals from which it is directly derived. This always happens, and it is because of that natural stability and everlasting continuity which will neither change nor vary unless superior forces act momentarily or constantly to produce a variation and deviation from the type to which the organism belongs.

Now, in the individual evolution of an organism, let us suppose a mammal, the fertilised egg-cell is multiplied in the ordinary manner, that is to say, by division, as in micro-organisms, and in consequence of multiplication by segmentation it is divided and subdivided into parts which are to constitute the organs in the living adult. Among these organs are found also those which must serve

in sexual reproduction. I mean the ovaries and spermatic glands, with all those accessories which serve afterwards in reproduction. The two cells from which the individual is derived, or from which the tissues and organs are derived, do not already contain the living organism as an adult in microscopic proportions. There is no need to accept this old hypothesis. They contain the potentiality of developing themselves and reproducing individuals of the very same forms and with the very same functions as those organisms from which they originate, and this always by the continuous persistence of nature which does not vary without a sufficient cause.

I do not admit that in the sexual cells special elements are found which in the variation of the organism become muscles, bones, or nerves. I hold on the contrary that when the egg-cell is multiplied into numerous cells and has then formed the well-known layers, each of these layers evolves into those tissues and then into those organs which originally represented nerves, muscles, bones, etc. And here again we see the stability of nature, because we find that the parts which in the embryo are evolved into nerve tissue, for example, correspond to the very parts which in the variations of the organism constitute the external element in contact with natural agents, and hence served in the defence of the organism. A similar thing might be said of the parts which produce the organs of nutrition, etc. That is to say, stability is not only conserved in individual reproduction but also in the evolution and formation of species or general types, genera and species.

So, there is nothing pre-established, but on the contrary, all depends upon the constant stability of nature, and therefore nothing is variable except when acted upon by a force superior to that stability.

I have said that there are two organs charged with the production of sexual cells. These two organs begin to appear, like all the other organs, in the embryo. In the fœtus at maturity may be seen the glands which may serve in reproduction when the individual shall have arrived at puberty. Is it necessary that these organs, ovaries and spermatic glands, collect the germ-plasm of Weismann, the gemmules of Darwin or the stirps of Galton? I

think not. It is only necessary that they give form to special cells with special functions, functions which are reduced to those of developing and reproducing the entire individual with all its organs and special tissues; as the cells of the derm reproduce nerve-tissue, those of the mesoderm, the connective tissue, etc. The office of the fertilised egg-cell is more extensive, for it may produce, by segmentation, cells which are disposed in layers, external, middle, and internal. These layers then generate the tissues and the organs. So, while in reproduction by division and by spores, the reproductive element is the integral part of the generating individual, in sexual reproduction by means of sexual cells the reproductive element is a secretion of organs deputised to the special office of reproduction.

Sexual reproduction at first takes place by the employment of the whole living substance which composes an individual which has no sex; then in the employment of the substance of two distinct individuals, and finally in the employment of only a part of the substance of distinct individuals which have assumed a sexual character.

How the first takes place is shown in the reproduction by simple division of a unicellular organism (Fig. 2) and in reproduction by spores which are the transformation of the whole living substance into many other organisms by means of the spore element. But there may be an important variation in this latter phenomenon which may give rise to sexual reproduction, or at least may represent the transition to it.

Professor Delpino recently made a very important study of reproduction and of the origin of sex.[1] This investigation was conducted principally upon vegetables where it is easier to observe and to experiment than it is upon animals. He finds and describes six types of fecundation, two kinds extracellular and four intracellular. These types show with much evidence the origin and evolution of sexual fecundation. The first type is especially interesting in this connexion. It is that of the naked and undifferen-

[1] *Revista di Scienze Biologiche.* Anno. II., 4-5. Como.

tiated gonoplasts, called sexual zoospores, or zoogonides, or planogametes, by different authors. Zoogonides is the name proposed by Delpino himself, and I adopt it. These plants are algae, whose mode of generation is of the first type, and Delpino affirms that they belong to seven families which are the most ancient of the stock. Notice what happens: a cell (zoogonange) contains a plasma which is subdivided into many globules destined to be individualised into gonoplasts. By the rupture of the walls of the

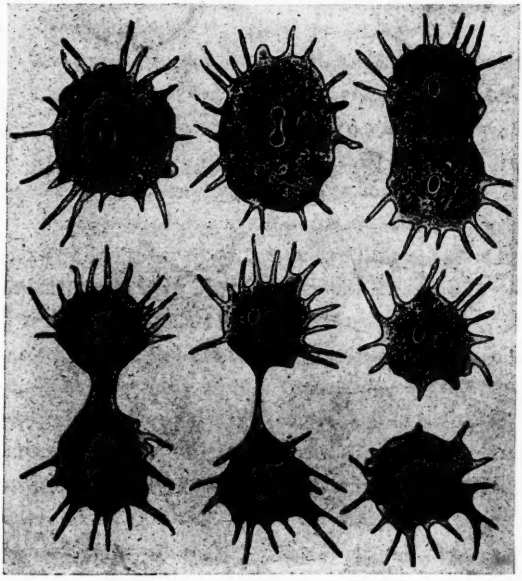

Fig. 2.

Amœba polypodia in six successive phases of scission. (After Schulze.)

zoogonangio, the globules issue forth and take on the pyriform figure with two cilia, by means of which they propel themselves rapidly through the water, and a beak. In their movement they encounter each other, unite in couples and finally fuse into one cell which becomes the new individual (Fig. 3). Delpino himself noticed that all the zoogonides do not find and unite themselves with others. Some are fixed, and like the spores, are developed into new individuals. That is, it may happen that their reproduction

may be agamic and sexual at the same time. There is here no illustration of real sexuality, but there is the origin of it, as appears from the second type mentioned by Delpino.

Without entering into the other very important problems concerning the origin of sex, so ably treated by Delpino, I wish to point out the fact that with this first type of fecundation, so admir

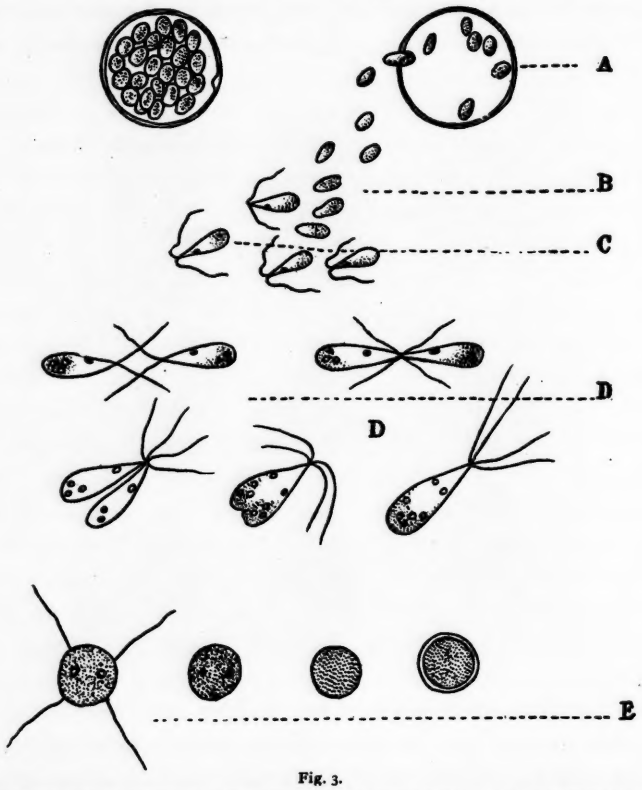

Fig. 3.

(*A*) Two cells (zoogonanges) with plasma divided into globules. (*B*) Globules which have assumed a pyriform figure with a beak and two vibratile cilia. (*C*) The corpuscles in movement naked gonoplasts). (*D*) The gonoplasts are united in couples and afterwards begin the process of fusion. (*E*) The successive stages (from left to right) up to the formation of the complete cell. (Delpino.)

ably described by him, we have the transition from reproduction by spores to sexual reproduction, and that in this transition is employed, as in the spores, the whole generative substance.

In a second stage of sexual reproduction we find the masculine and feminine elements distinct; but even in this case is equally employed the whole living parent substance, which is transformed into two sexual elements.

Finally there is a sexual reproduction in which only a small part of the parent substance is employed. This part is separated by a process which I have called secretion; two special organs, the ovaries and the spermatic glands, being constituted for the reproductive office. This third stage must naturally appear to be the most highly developed and the most perfect, because in this case the life of the parent is not sacrificed, as in the preceding cases. The parents survive and continue to produce new descendants without injury to their living substance. And it is the same with animals as with plants.

Hence, according to my conception of reproduction, whatever be the type or the stage of evolution of its scisions,—spores, or sexual union in the incipient or in the evolved form,—it is not necessary to admit the existence of a substance distinct from the living substance, which circulates and is transformed in every living individual and which has the predestined office of reproducing and of transmitting itself eternally without changing or varying, like the germ-plasm of Weismann. In the simpler living beings, which are agamic or amphygonic in the primordial forms, the living substance is all transformed into the reproductive elements with the death of the individual, and it is always and invariably the identical parent substance which is found in the individuals and in their descendants. So, also, in the higher and complete form of sexual reproduction, in which only a portion of the substance is employed, we may see that it must always be the same, and not another hidden and separate substance which assumes the reproductive office. The separation by means of sexual organs has taken place by a division of labor in the vital functions, especially from the time when the organisms began to have special tissues with their own functions, and when the utility of the individual's conservation became equal to that of the descendant.

If the heredity of forms is on account of the natural stability

of which I have spoken, which stability is like a force of resistance to all changes which may be produced by exterior influences, it follows that variations in organisms may take place only through the operation of forces which in special circumstances overcome the resistance exerted by nature against every change. This is the first condition for the production of variations in living organisms whether animals or plants. But this condition exists, because the living substance is in continuous and direct communication with external energies. In them and through them it lives and is preserved and even multiplies itself. Let us suppose that certain aquatic animals live in the sea at a profound depth and may also live at the surface. They are able to stand a definite aquatic pressure, let us say one hundred. Their organism is adapted to such a pressure, and when subjected to it, the parts are maintained in their normal condition. Their visceral cavities sustain no injury if they ascend to the surface or descend to the depth of a few meters beyond the average. Let us suppose, now, that by chance some of these animals which live at the surface are carried by some force to the depth of two thousand meters. Then, the aquatic pressure must be enormously increased, as, for example, to the extent of the difference between the weight of a column of water one hundred meters high and another of two thousand. Such animals could not resist so high a pressure and would perish. But let us suppose that some one of them does survive. This one will be slowly modified to resist such high pressure. The external force in this case is superior to the natural stability which resists changes, and overcomes it; and consequently the changes are produced.

But the objection of the Weismann theory, and in part that of Galton, is made, not against the possibility of variations which may be produced in individuals, but against their heredity. The same example serves us here. If such changes should not take place in the animal which survived at the profound depth to enable it to support the great pressure, it would not continue to live but would perish without descendants. We have supposed that the changes take place. Such changes are variations useful to the continuance of life. Without them this could not happen. Such variations

are transmissible because a descendant of such an animal, if it should not inherit such variations, would perish and there would be no further descendants.

It is curious to notice that Weismann, in combating Nägeli's theory of a self-modifying idioplasm, insists that the environment may modify an organism in the direction of adaptation. He chooses the whale as an example. "The whale," he says, "is a placental mammal, which, probably in secondary times, arose from terrestrial mammalia by adaptation to aquatic life. Everything that is characteristic of these animals depends upon adaptation."[1] This being admitted, Weismann enters upon a description of the particular facts which distinguish whales as aquatic mammals from other terrestrial mammals, and finds that their organs are modified precisely by the new conditions of life in which they live. But the interpretation he makes of this phenomenon is, to say the least, strange. For he must invoke sexual reproduction to account for variations which are hereditary, if the germ-plasm cannot vary and the somatic variations are not hereditary. On the contrary, it seems to me that the adaptation implies that the somatic modifications are hereditary, supposing even that the somatic plasma is distinct or separate from the germ-plasm, as Weismann would wish to do. And it seems to me useless to invoke sexual reproduction to explain the fact, which fact does suppose the heredity of newly acquired characters.

My conception, then, concerning the heredity of acquired characters is that if such variations are useful to the species, animal or vegetable, they become hereditary, that is, permanent in the species, because they form an integral part of the organism which lives under conditions from which it cannot escape. If, however, the variations are superficial, that is, are not necessary to the species to enable it to continue to live and to leave descendants, then they may be hereditary but are not necessarily so. They may be transitory or individual. The higher examples, as of the fishes of the Plankton or the Necton, which pass into the fishes of

[1] *Op. cit.*, p. 309 et seq.

the Benthos, and that of the whale of Weismann, show that the modifications or variations undergone in the new environment are necessary to the continuation of the life of the one and of the other. Hence they are not transitory, but are permanent and therefore hereditary.

I might yet say something in the way of explaining atavistic characters. I might construct an hypothesis as to how it happens that in the germ-cells, the ovule and the sperm-cell, the elements which reproduce the individuals from which these cells are derived may be found. But I have no intention of presenting a new theory of heredity, which would not be difficult to do, however, with a little use of the imagination. My purpose has been to show that the theories hitherto set forth are not only incapable of interpreting the facts of heredity but, what is more, they render them more complicated; that these theories are also a reappearance of occultism, because they seek for new plasma and admit occult virtues, as do the Vitalists and the Spiritualists; and that to interpret heredity as a general phenomenon it is enough to hold fast to the universal fact of the stability of nature, while variations imply the action of a force which modifies the organisms, which organisms, by the same natural persistence, must continue to live in the various conditions of their existence. I have sought to show by what means nature brings about descent and heredity in the different forms of reproduction, of which forms sexual reproduction is the highest and most evolved. In this form, therefore, individual existence is preserved because only a small portion of the living substance is employed in reproduction, and this substance is separated by a process common in vital functioning, namely, animal secretion. To my mind, therefore, the only plasma is that which composes the life-substance of all living beings, vegetal and animal, that is, the substance which Weismann would call somatic; and the germ plasm is in every case a derivation from it.

G. Sergi.

Rome, April, 1901.

PHILOSOPHY OF RELIGION AND THE ENDOWMENT OF NATURAL THEOLOGY.

IT has become a commonplace that the nineteenth century was an era of criticism, of destruction, of unrest. This view may or may not be true. And although the phrase has been bandied from mouth to mouth till many deem it a platitude, the time for final judgment lies still in the future. But if, the average opinion notwithstanding, there be room for wide difference on this point, all will admit that, during the period just closed, accumulation was never so rapid, so varied. Old sciences have undergone veritable transformations, strange and startling investigations have put in their claim for recognition, often with bewildering success. As a significant consequence, it is almost impossible for our contemporaries to think themselves back to the climate of opinion that marked the days when Laplace wielded primacy. Men have become so familiar with modern methods and are so saturated with another spirit that they tend frequently to forget the very recent origin of several important and transforming movements, and thus exact demands in these fresh spheres which, if not unwarrantable, at least omit to reckon with the lapse of time necessary for complete achievement or even for adequate insight. At the moment, it were superfluous to enumerate the lines of research where this phenomenon shows itself; suffice it to say that Philosophy of Religion is one. For this study, all things considered, was among the by-products thrown off during the momentous idealistic upheaval that overtook Germany between 1780 and 1850. No doubt, it might be argued fairly and with no small success that, prior, say, to such a notable landmark as Hegel's *Vorlesungen über die*

Philosophie der Religion, of 1829, this aspect of philosophy had acquired prominence. Yet, on the whole, if the Neoplatonic movement be ruled out, the chief principles incident to the study as understood now, prove sadly to seek. Some few mystics hit upon them in part, but, otherwise, dogmatic presuppositions tended to confine investigation within narrow or traditional limits. In the early Church, for example, apologetics gave an unscientific twist to the study everywhere. During the Middle Ages, the regnant conditions decreed an alliance between theology and philosophy, usually to the subservience, if not always the detriment, of the latter. Even the great movement of Arabian thought, the single source of light throughout many dark years, scintillated mainly by contrast with Christian prejudice; for, even here, the shadow of theological dogmatism threw pressing problems into shade effectually. An earnest of better things sprang from the Renascence, with Nicolas of Cusa, Bruno, and Campanella. Yet, even at this, the reactionary forces of the time, coupled with the rapid rise of rationalism, proved all too strong, and the "symbolical" or "mystical" theology, as it was called, passed away leaving no definite traces. Similarly, one cannot recall too often that the Reformation centered in a politico-ecclesiastical, not in an intellectual, alteration. The systematic thought of the Reformers does not differ in essentials from that of Augustine. The preconceived "plan of salvation" descended to the new presbyters who, in matters philosophical, proved as hopeless as the old priests. Thought found a prescribed task awaiting,—to bolster up dogma; and outside of Christianity, as materialised by Mediævalism, naught was conceived to lie but the sure road to damnation. Certainly, the mystics gleam here and there amid distressful obscurantists. But, for all their insight, they cannot stray far from self, and so relapse incontinently into a darkness of their own or blossom into pietists, recking little so be they find a safe road to a safe heaven.

Now, two conditions are prerequisite to successful prosecution of Philosophy of Religion;—complete deliverance from dogmatic reservation, and an atmosphere such that the work done may meet with response. Till the eighteenth century, both happened to be

lacking. With the gradual awakening of this century—the *sæculum rationalisticum*—to self-consciousness, the necessary freedom becomes more and more possible, even if the temper of the age, like its knowledge, hardly favor the indispensable genetic or organic standpoint. So much was this the case that a principal part of the early task of Philosophy of Religion happened to be the emancipation of thought, particularly the thought of the English-speaking peoples, from the mechanical categories of Natural Theology. What this Natural Theology was and implied we must try to see; for, thanks to several wealthy persons, it has been endowed lavishly in Britain within the past seventy years. And this endowment is notable, not only in itself, but also because it throws a light upon certain limitations of English thought, in the cisatlantic as well as in the transatlantic branch, of moment for our present inquiry.

Natural Theology, then, was an outgrowth of the Deistic movement. In this connexion it may be well to premise that the distinctive tenets of Deism by no means exhaust its interest for the discussion upon which we are about to enter. Indeed, one might go so far as to allege that they do not exhaust its chief lessons. For, deep significance must be attached to the fact that, on fundamentals, the Deistic leaders and their opponents, like Bishop Butler, agree. In a word, they are unanimous in adopting the same attitude towards the universe; the theory that satisfied the heterodox party commended itself equally to the orthodox. Moreover it consisted essentially in the scheme which nineteenth century thought has always striven to overthrow. Possibly, the best way to present it is by contrasting the Deistic standpoint with that occupied by representative churchmen of the time.

As usual, the question at issue dealt with revelation. In opposition to the churchmen, the Deists contended that, on inspection of history and society, a "natural religion" can be detected. That is to say, altogether apart from the special advantages which, as Lessing thought later, might be derived from revelation, mankind possesses at least a belief in God, and an ideal of duty. Of course, on this allegation, the problem of revelation is only post-

poned. For the real question comes to be, Is this all that one can say? Are we not forced to go beyond it in order to explain the facts? Taking the Deistic school in the large sweep of its teaching, the answer is in the negative decidedly. Such adumbration of Philosophy of Religion as may be detected consisted in conducting Religion to the bar of Reason, and putting the inquiry, Is "positive" religion amenable to explanation by rational means? The reply admits of no equivocation. On analysis (rational) of "positive" religion, all elements essential to its being and influence are traceable to man's natural endowment. Everything else can be classed legitimately as non-essential. In brief, those factors or accompaniments of religion that reason fails to span have their causes in non-religious influences. Loose thinking, for example, may be saddled with responsibility for much that masquerades as revelation. Similarly, the convenience of governments, or the machinations of a designing priesthood, account for other "divine" factors. As Bolingbroke has it, "Religion is a bridle in the mouth of the sensual mob." Further, if religion in general be susceptible to such treatment, no exception need be made in favor of Christianity. On the contrary, at its origin, Christianity happened to afford a typical specimen of "rational" or "natural" religion. All the excrescences added to it in the course of the ages were nothing but corruptions—unwarrantable interferences due to lapses of the Church from pristine purity, or to her unholy alliance with crafty politicians. Consequently, an important office of rational criticism was to purge away such additions, leaving nothing but the original, uncontaminated product. If to-day we could find an orthodoxy untouched by the atmosphere of modern science, and if similar arguments could be directed against it, what a fluttering would be caused in the dovecots! Nevertheless, bitter although controversy then was—running in some cases to the length of persecution—the amazing thing is that it did not go further. Almost invariably, we find a party in the Church which perceived the advantages of the freedom and toleration desired by the Deists. For instance, Paley, the Cambridge professor of Divinity, speaking of the Anglican Church, says, let her "discharge from her liturgy controversies

unconnected with devotion; let her try what may be done for all sides, by worshipping God in that generality of expression in which He Himself has left some points; let her dismiss many of her articles, and convert those which she retains into terms of peace; let her recall the terrors she suspended over freedom of inquiry; let the toleration she allows to dissenters be made *absolute;* let her invite men to search the Scriptures; let her governors encourage the studious and learned of all persuasions; let her do this, and she will be secure of the thanks of her own clergy, and, what is more, of their sincerity. A greater consent may grow out of inquiry than many are at present aware of." When one remembers some modern controversies, this may seem sufficiently wonderful. But, when the matter is subjected to closer examination, wonder takes flight.

Little as they may have been conscious of it, the truth was that Deists and churchmen possessed no profound reasons for quarrel, because, in their general conception of the nature of the universe, they agreed at bottom. And this constitutes the central point of interest for us now. The seventeenth and eighteenth centuries became gradually dominated more and more by that theory of things known as the "Newtonian philosophy." Fundamentally, this depended on the hypothesis of gravitation. Matter is characterised by two properties—gravitation and inertia. Thus, the problem of its ultimate constitution need not be attacked forthwith; but, seeing that a field so extensive lies fallow in connexion with the properties, may well be put off. Pursuant to this, the properties were found to be attached to certain masses of matter, moving in empty space. Thus, to explain the universe, it is sufficient, meantime, to investigate the relations of these masses to each other, and to describe their behavior. If the inquisitive inquire, How did the properties get there? the ready answer is, They were caused by an Agent. On the side of theology, so long as you confine yourself to discussion of the properties, you occupy the Deistic standpoint; while, the moment you ask how they came into the universe, you side with the churchmen. But, whether you choose one alternative or the other, your theory of the completed system

of things remains identical in essentials. Accordingly, just as secular learning divides itself into two separate portions, one dealing with relations involved in the properties of matter (science), the other dealing with the problem of guarantees (metaphysics), so in theology you cannot avoid a parallel classification. Natural Theology discusses design, or the evidence presented by nature through unaided human reason; that is, it passes from consequnce to antecedent, but entirely without the help of revelation. On the contrary, Revealed Theology pivots upon miracle, or the direct interference of the divine Author with his designs—to accomplish particular purposes not contemplated in the original plan. The point to be made is just this: Whether the one study or the other be pursued, the same framework furnishes the limits or directions of investigation. For both, the universe is little more than a crass substance operated on, from a distance, by some Being whose essence and ways are inscrutable, because known to us only in physical consequences. The dualistic attitude determines everything. For God exists by himself somewhere off in the clouds, and the universe, scattered through space, speeds on its way in isolation from him, except for the abnormal interferences. The Deity may be a magnified mason, or clockmaker, or optician; or, on a slightly higher level, "a necessary Being,"—one existence among the planetary spheres, invisible as compared with them, no doubt, but external to all, and therefore another piece on the cosmic chessboard. In the same manner, and as a logical accompaniment of this doctrine, the human soul may be defined as "a simple, incorporeal substance"—a substance utterly irrational, so far as experience can throw light upon it, nevertheless, like Deity, taking its place among other substances. It may be classed as an extra part of the universe, even if it cannot be demonstrated by inspection of the parts. On this basis, the books of the mind could be kept by double entry, and thus the central problem could be dismissed, or, as the fact was, slurred altogether. On such terms Philosophy of Religion simply could not exist; no demand for it was possible.

Now, we must never forget that this general condition held

dominion over the English-speaking folk till well on in the nineteenth century. Nothing else is contemplated, for example, even in the third edition of Whewell's *History of the Inductive Sciences* so late as 1857. Furthermore, with fine genius for compromise, one of its main marks and one that accounts for much of its political success, the English mind has long been, and still is, engaged in attempts to tinker this very system under the influence of the organic idea of the universe, the principal contribution of the nineteenth century to progress in thought. Nay, so deep has the view become that men have been found to foster it several generations after it had been discreetly buried, say, in Germany. And on this interesting situation it may be worth while to bestow some attention.

The endowments alluded to above are three in number: (1) the Burnett; (2) the Bridgewater; (3) the Gifford. As the first and second are matters of history to-day, we may dismiss them briefly. The third demands more serious attention, not only on account of its present prominence and results, but also for the personality of its founder.

1. John Burnett was a merchant, of Aberdeen, Scotland, who lived from 1729 to 1784. His interest in things religious is evinced by the fact that he absented himself from public worship,—a much more notable proceeding then than now, fearing that he might become committed to the creed of some church. The mere circumstance points to a real religious interest. The Bequest was made in 1784. In the Preface to his *Theism; the Witness of Reason and Nature to an All-wise and Beneficent Creator* (1855), the late Principal Tulloch, of St. Andrews University, wrote as follows: "The circumstances in which this Essay originated are probably familiar to many. It has been thought proper, however, briefly to state them here. Mr. Burnett, a merchant in Aberdeen, whose character appears to have been marked by a rare degree of Christian sensibility and benevolence, amongst other acts of liberality, bequeathed certain sums, to be expended at intervals of forty years, in the shape of two Premiums, inviting to the discussion of the evidences of religious truth, and especially to the consideration and confirmation of the attributes of Divine Wisdom and Goodness. . . . On the

previous occasion of competition, the first of the Premiums was awarded to the late Principal Brown of Aberdeen, and the second to the Rev. John Bird Summer, Fellow of Eton College, and now Archbishop of Canterbury. On this occasion, the First Premium of £1800 has been adjudged to the Rev. R. A. Thompson, M. A., Lincolnshire; and the second, of £600, to the present writer." The subject of investigation, as laid down by the founder, was as follows: "The evidence that there is a Being, all-powerful, wise, and good, by whom everything exists; and particularly to obviate difficulties regarding the wisdom and goodness of the Deity; and this, in the first place, from considerations independent of written Revelation; and, in the second place, from the Revelation of the Lord Jesus; and, from the whole, to point out the inferences most necessary for, and useful to, mankind." All things considered, then, this foundation was on the orthodox side, though with no undue rigidity. And it was made when Hume's philosophy happened to be causing some searching of heart in Scotland. The first award, mentioned as above by Tulloch, took place in 1815; the second in 1855. Since 1855 the funds have been applied by the University of Aberdeen to the provision of a lectureship in some branch of archæology, or science, or history, so treated as to illustrate Natural Theology. While the early Essays on the foundation show small sense for anything beyond the old deistic purview, it is interesting to note that the epoch-making lectures of Robertson Smith, on the "Religion of the Semites," were given on the Burnett Fund; they serve to illustrate how far we have travelled from the Founder's intention. I understand that the greater part of the fund is now to be appropriated to the institution of a professorship of History in Aberdeen University.

2. By a will, dated 25th February, 1825, the Rev. Francis Henry, eighth Earl of Bridgewater, left a sum of £8000, to be given, by the President of the Royal Society (London) to such persons as he might select to write and publish treatises "On the Power, Wisdom, and Goodness of God as manifested in the Creation." The Earl died in 1829, and the then President of the Society divided the funds into eight portions, of £1000 each, with

the result that the last great series of works in English, on Natural Theology, was produced as follows: *The Adaptation of External Nature to the Moral and Intellectual Condition of Man*, by Thomas Chalmers; *The Adaptation of External Nature to the Physical Conditions of Man*, by John Kidd; *Astronomy and General Physics considered with reference to Natural Theology*, by William Whewell; *The Hand, its Mechanism and Vital Endowments as evincing Design*, by Sir Charles Bell; *Animal and Vegetable Physiology considered with reference to Natural Theology*, by Peter Mark Roget; *Geology and Mineralogy considered with reference to Natural Theology*, by William Buckland; *The Habits and Instincts of Animals with reference to Natural Theology*, by William Kirby; *Chemistry, Meteorology, and the Function of Digestion considered with reference to Natural Theology*, by William Prout. The character of these books (which can be bought *en bloc* to-day for a few shillings) is well brought out by Professor Caldecott, in the most recent contribution to the history of religious thought in England. Chalmers "had no time for the study of German Idealism; the Traditional Theism was out of accord with the Sciences as he read them and with the Scientific men with whom he came into contact; Induction offered itself as a Method, in the form of Teleology applied to contrivance and adaptation. We have seen how weak was his confidence in the result when he came to look at it after his case was stated. As a practical man it did not really concern him very much; he nearly escapes into Ethical Theism more than once; and Revelation was at hand to supply sufficient basis if Natural Theology should wholly fail."[1] This, when the entire movement involved in the work of Herder and Kant, Goethe and Hegel was a commonplace in Germany! Small wonder that Hegel rubbed his eyes when he looked across to England, and referred, with his customary sardonic humor, to the Philosophy of Hairdressing.

3. On a previous occasion,[2] I had the opportunity of calling attention to the circumstances of the foundation of the Gifford Lec-

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[1] *Philosophy of Religion in England and America*, p. 135.

[2] *The Open Court*, Vol. XIII. (February, 1899), pp. 72 ff.

tureships at the four Scottish universities, and noticing some of the consequences. It is unnecessary, therefore, to repeat the details now. Suffice it to say that Adam Gifford (1820–1887), a judge of the Scottish Supreme Court (Senator of the College of Justice is the Scottish title), devised the sum of £80,000 to the four universities for the purpose of founding lectureships on what he termed Natural Theology. Since I wrote the article for *The Open Court*, I have come into possession of certain of Gifford's writings, —privately published; and I have permission to make use of them. They are of importance as showing how the Founder himself felt vaguely that Natural Theology had passed away, although he did not seem to comprehend why. His experience, then, may be of service in casting a fresh ray upon the curious backwardness of the English-speaking mind in this matter.

To begin with, his testamentary directions stand in strong contrast to the somewhat limited provisions of Burnett and Bridgewater. In part, they read as follows:

"I having been for many years deeply and firmly convinced that the true knowledge of God, that is, of the Being, Nature and Attributes of the Infinite, of the All, of the First and the Only Cause, that is, the One and Only Substance and Being, and the true and felt knowledge (not mere nominal knowledge) of the relations of man and of the universe to Him, and of the true foundations of all ethics and morals, being, I say, convinced that this knowledge, when really felt and acted on, is the means of man's highest well-being, and the security of his upward progress, I have resolved . . . to institute and found, in connexion, if possible, with the Scottish universities, lectureships or classes . . . for promoting, advancing, teaching, and diffusing the study of natural theology, in the widest sense of that term, in other words, the knowledge of God, the Infinite, the All, the First and Only Cause, the One and the Sole Substance, the Sole Being, the Sole Reality, and the Sole Existence, the knowledge of His nature and attributes, the knowledge of the relations which men and the whole universe bear to Him, the knowledge of the nature and foundation of ethics and morals, and of all obligations and duties thence arising. . . . No person shall hold the office of lecturer in the same city for more than six years in all, it being desirable that the subject be promoted and illustrated by different minds. The lecturers appointed shall be subjected to no test of any kind, and shall not be required to take any oath, or to emit or subscribe any declaration of belief, or to make any promise of any kind; they may be of any denomination whatever, or of no denomination at all (and many earnest and high-minded men prefer to belong to no ecclesiastical denomination); they may be of

any religion or way of thinking, or as is sometimes said, they may be of no religion, or they may be so-called sceptics, or agnostics, or freethinkers, provided only that the patrons will use diligence to secure that they be able, reverent men, true thinkers, sincere lovers of and earnest inquirers after truth. I wish the lecturers to treat their subject as a strictly natural science, the greatest of all possible sciences, indeed, in one sense, the only science, that of Infinite Being, without reference to or reliance upon any supposed special, exceptional or so-called miraculous revelation. I wish it considered just as astronomy or chemistry is. I have intentionally indicated, in describing the subject of the lectures, the general aspect which personally I should expect the lecturers to bear, but the lecturers shall be under no restraint whatever in their treatment of their themes; for example, they may freely discuss (and it may be well to do so) all questions about man's conception of God or the Infinite, their origin, nature, and truth, whether he can have any such conceptions, whether God is under any or what limitations, and so on, as I am persuaded that nothing but good can result from free discussion. . . . And my desire and hope is that these lectureships and lectures may promote and advance among all classes of the community the true knowledge of Him Who is, and there is none and nothing besides Him, in Whom we live and move and have our being, and in Whom all things consist, and of man's real relationship to Him Whom truly to know is life everlasting."

The external incidents in the life of the strong, noble, and kindly author of this remarkable document are not numerous. Born in 1820, the son of an Edinburgh merchant, he was brought up as most boys belonging to his social class were at that time. Religious influences must have been strong in his early days, for his father belonged to the straitest sect of Scottish religionists, and Gifford himself taught in Sunday school. Yet although nurtured thus, he did not come of a bigoted stock. It has been said significantly of the father, "His reading and thinking led him into regions beyond those in which most men live and move, and a certain far-sighted wisdom, touched with poetry and idealism, characterised his opinions. As a consequence, these were often in advance of his time; and his children have lived to see some ideas of his, which were regarded as Utopian when he uttered them, secure a place in men's common thoughts." Gifford's mother, too, was a woman "not much taken up with the externals of life, but deeply impressed with its spiritual realities." The home environment, therefore, was calculated happily to impress the youth with the

importance of religious questions, but these were not presented in that gloomy or canting fashion which so often throws young zeal into a scoffing mood later on. In brief, Gifford had just that kind of home influence to which many of the most remarkable Scots of the time have traced much of what was best and most tenacious in them and in the causes for their success in life. As a boy he was dubbed "the philosopher" by his playmates, a name he earned from his marked habit of reading and thinking. At fifteen he apprenticed himself to an Edinburgh solicitor, and, as so many Scots lawyers' clerks still do, attended classes at the university. During this period he was an omnivorous reader, and taught Sabbath-school. In 1849 he quitted the solicitor's business, and became a member of the Scottish bar, which was to provide him with his life-work. An advanced Liberal in politics—which in Scotland implies nothing as concerns theological views—he appears to have taken no prominent lead in party affairs, and received no recognition of importance from Government till 1865, when he obtained appointment as Sheriff-Principal. In 1870, to the surprise of his friends, he was raised to the Scottish Bench; in 1881, paralysis, which had threatened him for a decade, disabled him completely, and he retired into private life, devoting his last years to the study of philosophy and theology, subjects in which he was already expert. Some of his sayings at this crisis shed light on the problems uppermost in his mind. "I have often wished for leisure to read and to think, now I have it." "I think I have seen more clearly many things about God since I have been laid aside." "To be happier or wiser, that just means to have *more of God*." Although he was among the greatest advocates of his day, and earned his large fortune by his own talents exclusively, it has been said "that his heart never was entirely with his profession. With the technicalities and verbalism of law he had no sympathy, nor with the petty squabbles of men, to decide which he was obliged to give his close attention. The only region of law in which he could freely breathe was that in which are found the principles of true and unchanging justice. He was an equity lawyer, and in any case where he could apply these principles, he swept precedent and word-

splitting aside, and fearlessly did the right. . . . He sought higher subjects of thought and higher enjoyments. . . . He read much, and read on every subject. . . . He read with his mind fully awake, and, as he marked each book he read, so every memorable thing was marked in his mind. While he read the records of the mighty thinkers of olden times in Latin, French, or German, and knew something of most of them in science and philosophy, he was fully abreast with the most recent thought. . . . His mind became more and more absorbed in philosophy and theology, or rather philosophic theology. He had all his faculties during the first years of his illness, and he had ample leisure to employ them. They were largely engaged in the highest and most difficult problems of God's nature and man's relation to Him. He studied and admired Spinoza, yet always denied that he himself was a Pantheist, marking the distinction thus: 'Spinoza holds that everything is God. I hold that God is everything; if I were to assume a name descriptive of my belief, I should be called a Theopanist.' . . . He sided with Bishop Berkeley in the doctrine of the superior evidence for the existence of mind compared with what we have for the existence of matter, and had no sympathy with materialism. He seemed sometimes to wish he had strength to contribute his thoughts, to counteract the prevailing materialistic philosophy of our day. . . . The Bible he knew well and studied much, though he did not hold the doctrine of verbal inspiration. . . . The Gospel of John was more in harmony with his mind than the Pauline writings. . . . His favorite definition of the creature was 'a part of the Infinite,' for, he said, 'the Infinite cannot be infinite if it does not include everything.' He treated man's consciousness of personality and the testimony of his intuitions with little reverence, holding God and God's infinite existence as all and in all, overlooking that our knowledge of God, however imperfect, can only rest on our knowledge of ourselves."

In the case of a thinker like Gifford, who has left nothing whereby formal conclusions can be estimated or even guessed, the course of whose personal thought remained a matter so private that no account of it is forthcoming from those who knew him best, one

cannot expect to arrive at conventional or systematised results. In any case, however, this is clear; he had travelled far from the atmosphere breathed by the natural theologians and their opponents, and he tended to think in categories to which British thought had been a stranger since the far-off days of the Cambridge Platonists. It becomes necessary, therefore, to notice the direction taken by European speculation after the bankruptcy of eighteenth century philosophy. Having done this, it will be possible to arrive at a less indefinite view of the tendencies implied in the theme taken to heart so deeply by Gifford.

The British mind remained unconscious of the organic and historical standpoint throughout the first sixty years of the nineteenth century. And the same may be said of systematic thinking in the United States. Of course, one does not forget Coleridge and Carlyle and Emerson and the Tractarian Movement. But these hardly belong to the circle of scientific investigation. On the whole, Paley manages to remain representative, as the *Bridgewater Treatises* show; and he knew nothing of Kant, of the German Romantic writers, or, still more wonderful, of Hume's *Natural History of Religion* (1757), not even of the posthumous *Dialogues*, published twenty-three years prior to the *Natural Theology*. While, as was to be expected, Spinoza passed over his head completely. Turning to Germany, a very different situation bursts upon one. The second half of the eighteenth century was marked by a curious, almost paradoxical, movement, as Prof. Kuno Francke has shown so well. Contrasted with the traditional individualism of England, we find the rise and spread of a "social sense," which expresses itself in an individualistic fashion by making personal culture the ideal of life. "Whatever there was progressive in German thought tended, on the one hand, toward a disintegration of the collective forces of an outworn society; on the other, toward the unfolding of isolated independent individuals, the germ-bearers of a new social order."[1] But these individuals develop themselves under the inspiration of a fresh, vitalising idea. This may be char-

[1] Kuno Francke. *Social Forces in German Literature*, p. 265.

acterised as the reorientation of the individual by reference to the universal elements which bestow significance and greatness. It can be traced as early as 1755 in Winckelmann's *Gedanken*, then in Lessing's *Nathan* (1766), and *Education of the Human Race* (1780), and in Herder's *Fragmente* (1767), even although, in these works, it is struggling as yet with the static conceptions peculiar to the kind of thought associated mainly with the eighteenth century. Nevertheless, despite this pervading contemporary influence, a few brief years serve for its emancipation, with Herder, even if he cannot be said to hold an even balance or to be certain of himself always. His most notable work, *Ideen zur Philosophie der Geschichte der Menschheit* (1784–1789), as Julius Schmidt has noted rightly, takes its place beside Kant's *Kritik der reinen Vernunft* as embodying the significant tendencies of the age. Nor is this all. Kant's star was destined to wane for two generations, while Herder's suggestions, albeit with little recognition of the part he had played, were to acquire ascendancy. In short, his central ideas—the conception of development, and the organic view of the universe—were to become very familiar, thanks to poets, humanists, and metaphysicians, long ere the positive sciences evinced recognition of their vast importance. Herder "represented the whole history of mankind as a succession of national organisms; each revolving round its own axis; each living out its own spirit; each creating individual forms of language, religion, society, literature, art; and each by this very individualisation of national types helping to enrich and develop the human type as a whole."[1] Here are the prophetic utterances, in which he lays the foundation, not only for Philosophy of Religion, but for all the new historical sciences, for modern philology in its widest sense; "History leads us, as it were, into the council of fate, teaches us the eternal laws of human nature, and assigns to us our own place in that great organism in which reason and goodness have to struggle, to be sure, with chaotic forces, but always, according to their very nature, must create order and go forward on the path of victory."[2] Thus the artificial

[1] Kuno Francke. *Ibid.*, p. 325. [2] *Ideen*, Book XV., 5.

distinctions of previous thought are to put to flight. The dualisms between matter and mind, between understanding and reason, between nature and God, between natural and revealed theology, solve themselves, thanks to the discovery of a principle that points toward a higher unity, presupposed by these very distinctions, and rendering them possible.

Once more, if much is to be learned from the positive teaching of Herder, his opposition to Kant, almost intuitive, is hardly less significant. A certain lack of humor, often traceable to the distorted perspective that pertains to propinquity, prevented him from perceiving the real situation as it appeared, for example, to such a writer as Heine. Whatever its defects on the side of technical scholarship, Heine's brilliant insight reveals, in large measure, the cause of Herder's restlessness. "I refrain from all popular discussion of Kant's argument in disproof of the ontological evidence for the existence of God. Let it suffice to give an assurance that since Kant's time deism has vanished from the realm of speculative reason. It may perhaps be several centuries yet before this melancholy notice of decease gets bruited abroad universally; we Germans, however, have long since put on mourning. *De Profundis!* You fancy, then, we may go home now. On my life, no! there is yet a piece to be played; after the tragedy comes the farce. To this point Immanuel Kant has pursued the path of inexorable philosophy. He has stormed heaven, and put the garrison to the edge of the sword; the ontological, cosmological, and physico-theological body-guards lie there lifeless; Deity itself, deprived of all demonstration, has succumbed; there is now no all-mercifulness, no fatherly kindness, no other-world reward for renunciation in this world, the immortality of the soul lies in its last agonies,—you can hear its groans and death-rattle; and old Lampe is standing by with his umbrella under his arm, an afflicted spectator of the scene, tears and sweat-drops of terror dropping from his countenance. Then Immanuel Kant relents, and shows that he is not merely a great philosopher but also a good man; he reflects, and half good-naturedly, half-ironically he says: 'Old Lampe must have a God, otherwise the poor fellow can never be happy. Now, man ought

to be happy in this world; practical reason says so;—well, I am quite willing that practical reason should also guarantee the existence of God.' As the result of this argument Kant distinguishes between the *theoretical* reason and the *practical* reason, and by means of the latter, as with a magician's wand, he revivifies deism, which theoretical reason had killed." Between old and new, the age was not yet sure of itself. A constructive Philosophy of Religion was necessary to replace the old Natural Theology, but, for all his originality, Herder could not furnish it. He assembled not a few of the most formative ideas, but it was decreed that he should not complete the structure. From the welter of Kant and anti-Kant, of *Sturm und Drang* and Romantic aspiration, of Fichtean earnestness and Schelling's fertile changes of front, Hegel came at length to put an end to bewilderment by building the essential elements into a single grand scheme. With him the first act in the drama of nineteenth century thought closed.

An exposition or appreciation of the Hegelian system would occupy much time, might trench upon eternity, possibly, and this is not the place for it. But circumstances demand that we try to see, very briefly, what Hegel accomplished. His Philosophy of Religion happens to be one among several applications of his central principle. Like its fellows, it consists in an evolution of an involution. The universe as known in human experience—and there can be no other—presents itself for explanation as a self-developing whole. In the process of its self-manifestation, it passes from stage to stage. That is to say, an immanent principle binds everything together, and appreciation of the details at any chosen point depends entirely upon a due apprehension of the places they occupy in the universal phases of this principle as it expands its inwardness. Moreover, this synthetic and controlling power cannot be alien from human thought; nay, the two are one; for human reason is reason just in proportion as it reveals the significance of the cosmic unity, of which it is part and parcel. Accordingly, religion cannot be fenced off from ordinary life and relegated to some consecrated enclosure of its own. Further, as it is one of the most characteristic or self-explanatory parts of human experi-

ence, we must expect to find it giving meaningful glimpses of the inner unity. Therefore, Philosophy of Religion consists in the effort to separate the permanent from the contingent, to lay firm hold upon the immanent principle of union amid the puzzling alterations incident to manifold particular changes. Thus, philosophy and religion are one, because both seek the same object, the same eternal truth. As a result of this insight, Hegel was the first to perceive that Philosophy of Religion must execute a double task. First, on the systematic side, it ought to show what Religion is, to point out the elements involved, not, however, by way of a barren analysis, but by an intimate presentation of the formative moments always traceable in its vital manifestation. Secondly, it ought to trace these moments, in their greater or lesser fullness, as they can be seen in the history of religions. In a word, the systematic and historical inquiries are complementary and indivisible. As contrasted with the old Natural Theology, we have here a synthetic, comparative and historical method; as opposed to dualism and deism, we have idealistic monism and panentheism.

Every one knows that, since 1860, this point of view has entered into and modified profoundly the thought of the English-speaking peoples. Prior to this date, there was a long period of preparation, when seers, like Coleridge and De Quincy and Carlyle and Emerson prophesied in the wilderness. Gifford's life lay chiefly in this period, but he had previsions of what was to come. What did come, as we now begin to see, may be stated somewhat as follows. The higher or historical criticism of the Old and New Testaments impinged upon the English mind at the time when Darwin's epoch-making work burst upon the world. And, as if this were not enough, the blast of German idealism swept through our universities during the same period. So, all the old, familiar landmarks appeared to be going by the board at once. Probably the average man could have endured the contumely heaped on Locke and Reid and Hamilton, and on the fathers of New England metaphysicising. He takes no very vivid interest in such things and, above all, is slow to see what the criticism implies concerning his cherished creed. Free-will and conscience and common sense and

natural rights may be consigned to the lumber-room of tradition without arousing his suspicions too deeply. But if, in addition, the Bible be arraigned at the same bar as the Vedas, the Iliad, the Qu'uran, the Divine Comedy, and the Elizabethan Drama; and if man be reduced from his centric position—as the person for whom the universe and the "plan of salvation" exist—and be relegated to his place among the other animals, the import of the philosophical movement becomes much plainer, and the effect of philosophy, historical criticism, and science in combination possesses strength sufficient to shake the strongest nerve, to arouse the most indifferent. Dismiss Reid and Mansel and McCosh for pifflers, and no great harm is done. But hint that "Jonah" contains an allegory, that the Hebrews found a new Baal at Horeb, that no one knows who wrote the "Gospel of John"; suggest that the human mind and "soul," like the human body, can be explained by natural causes,—and forthwith alarm rings out over the land. Let all these conclusions rain problems at once, and panic is apt to ensue. Nevertheless, panic or no panic, the English mind required the medicine that Time had in store. But it took the dose in its own fashion—with a large infusion of compromise. As a consequence, Hegelian influences stand to a great extent for a temporising rather than a radical movement. Here and there a book like the late Dr. William Mackintosh's *Natural History of the Christian Religion* has seen the light, but only to fall from the press still-born. On the other hand, Professor Otto Pfleiderer's *Gifford Lectures* produced a storm which, whatever may be said of it otherwise, was vastly interesting, because several of his opponents had themselves imbibed deeply of the doctrines he favored, and all of them must have known that he was retailing Teutonic commonplaces. Thus, in the main, such Philosophy of Religion as Britain and the United States have had has avoided fundamental problems, and has striven to patch up a working universe out of the fragments left from mediævalism and Natural Theology, *plus* plan and embellishment from the Herder-Hegel synthesis. Similarly, on the scientific side, the intellectual history of Romanes—beginning in Paleyan orthodoxy, passing to materialism, thence to something like hylozoism, and

ending at length in Anglican mysticism—may be taken as symptomatic, if not exactly typical. To be brief, the reaction upon the interposition of Hegel has not led beyond Hegel. So, just as German industry has spent the seventy years since his death in accumulating masses of new facts, many of them filled with the promise of new problems, awakened speculation among the English-speaking peoples has been familiarising them with a point of view whose adoption seemed to demand too great a price. The Gifford Foundation is well calculated, not only to continue this work, but to lead beyond it.

Returning now to Gifford himself; it is no disadvantage that, like so many of his compatriots (Hobbes, Locke, Berkeley, Hume, the Mills, Mr. Spencer), he did not attack philosophico-theological questions as a professional. On the contrary, even if his remains be meagre, we can see the man working freely in his own way. The excerpt from the Deed, and the other quotations given above, prove that he was dissatisfied with the traditional dualism and individualism of the British mind in its attitude towards ultimate problems. They prove also that he had not shaken himself clear completely from these limitations. For example, he cannot endure a God separated from the universe, he is, as he says, a "Theopanist." At the same time, he often writes as if this separation were a fact, and from some of his lectures further significant insights can be gleaned as to the transitional stage in which he lived. These "Lectures," it may be added, were published privately after his death. The following are their titles and dates. (1) *Ralph Waldo Emerson* (1872); (2) *Attention as an Instrument of Self-Culture* (1874); (3) *Saint Bernard of Clairvaux* (1875); (4) *Substance, a Metaphysical Thought* (1878); (5) *Law a Schoolmaster; or, the Educational Function of Jurisprudence* (1878); (6) *The Ten Avatars of Vishnu* (1880); (7) *The Two Fountains of Jurisprudence* (1880). To begin with, it is evident throughout that Gifford had detached himself from the traditional ways of English thinking to a considerable extent. Those declarations are significant enough. "The truth is, that although in education and elsewhere we may try to separate secular from sacred, and provide time-tables and conscience clauses

and so on, religion will not be separated from anything whatever! It will penetrate every cranny and pervade every space, and it will flow around and through every subject and every substance like electricity. You cannot produce and you cannot maintain a religious vacuum, and if you could, even secularism would die in it." Again, referring to the portents that heralded St. Bernard's birth, he writes: "Omens of this kind, and in cases like that of Saint Bernard, are probably very often invented after the event, and after the foretold greatness has been actually attained. In other cases perhaps they tend to produce their own fulfilment, and stimulate the genius or the exertions of him who believes himself heralded from on high. In any view, the belief in such omens, wide and universal as it has been, is an interesting fact in the history of humanity during the *ages of faith*." We do not expect a Scot, even now, to be tender toward the Roman Church, but Gifford gives us the following: "The Church was the last bulwark of humanity in the Dark Ages. She kept in awe the rude barons and the barbarous kings, and took the poor and forsaken to her bosom. To the everlasting praise of the Catholic Church be it said, she never knew any difference between rich and poor, between the nobly born and the lowly born, but welcomed all alike to her loving, though somewhat rigid, arms. . . . With all her failings, the Church was almost always on the side of justice and mercy and humanity." Speaking of the subject of miracles, he points out that "it is closely connected with the modern phenomena of mesmerism, of catalepsy, of spiritualism, and of trance." And on the cognate subject of the human soul, he says: "The human soul is neither self-derived nor self-subsisting. It did not make itself. It cannot exist alone. It is but a manifestation, a phenomenon." Writing on the legend of the First Avatar of Vishnu, he shows his acquaintance and agreement with the modern historical standpoint. "The affinity of this legend with the Mosaic account of the Deluge is too obvious to need notice, and the contrasts are also remarkable. Both probably came from the same source, but the best authorities hold that there is no reason to think that the one was borrowed or adapted from the other. There are traces and traditions of a deluge in all early

religions, and perhaps it is not impossible that some of them may have originated in dim and imperfect readings of misunderstood geologic facts. Shells are found embedded in the strata even on the tops of lofty mountains, impressions of fish are disclosed almost by every hammerstroke in the limestone cliffs, and nothing is more natural than the suggestion, (indeed nothing is more true), that the sea has once been there. It is only a hasty and hurried guess that the sea came there by a miraculous deluge, instead of in the orderly revolutions of untold millenniums." In an address to a Young Men's Christian Association, delivered twenty-three years ago, we find this statement, not noticeable now, but "advanced" then, especially when we remember its environment—the most ecclesiastical of Scottish cities. "Let me also ask you, as an humble but thorough-going disciple of science, to take nothing on my word, nothing on my authority, or on the authority of any other man. Science knows no authority but the intuition of truth. Search for yourselves, and see if we have not been speaking the words of truth and soberness. A Young Men's Christian Association should above all things be *free*. Free in the noblest and highest sense. The truth—fear it not in any guise—the truth shall make you free."

Similarly, one can detect here and there how Gifford had moved far from the individualistic standpoint of his folk and early youth, with its fixed distinctions. "To try to fix, to define, and to enforce a man's duty to himself alone, and apart altogether from the interests and the rights of his fellows, would be to ignore and to destroy that equal and inalienable right which I have already claimed for every man to use and to enjoy to the fullest all his faculties, provided only he leaves entire and untouched the very same equal use and equal enjoyment to every other. His rights can only be limited by the equal rights of his neighbor—using that word neighbor in its widest sense as including all men and their descendants." Once more, "Moral truth, like every other kind of truth, is unchangeably and eternally the same. It is founded in the nature of *things*, as it is called,—that is, in the nature of God. But moral *science*,—that is, man's knowledge, man's *scientia* of morality,—is constantly varying, now advancing, now receding; and moral sci-

ence, like every other science, is essentially progressive, and capable of indefinite advancement. . . . And so morality is not a fixed, but a growing science; and it is not an independent, but a dependent and superadded science! It is superior to, and yet dependent upon, all the discoveries of intellect, and of science, of history and of metaphysics." To the same effect is the following, which serves to illustrate how Gifford had broken the bonds of a provincial sectarianism. "In Hinduism will be found spiritualism the most refined for the spiritualist, and materialism the grossest for the modern atomist. . . . To the philosophic monotheist is presented an ideal of deity too lofty for expression, dimly indicated as the unthinkable and the forever unknown; while to the idolator is thrown open the vastest pantheon, crowded and populous with Superstition's nameless and innumerable brood. The ritualist and the devotee may find ceremonies and penances which would consume a thousand lives, while the holy and the devout may spend unconscious centuries in the ecstasies of absorption. . . . In primary or original theology, in speculative theism, and in the grand doctrine of the Immanence of God, I think that Buddhism is far inferior to Brahmanism, but it is greatly superior in its moral teaching, and indeed the wonder is that moral teaching so high should be rested on a system which it is difficult to defend from the charge of being atheistic. . . . Truly, Hinduism may claim to be a *catholic* religion." Finally, in his lecture introductory to the first Course of Gifford Lectures delivered before the University of Glasgow, the late Max Müller, who seems to have taken trouble to inform himself on the subject, declares: "There can be no doubt that he [Gifford] deliberately rejected all miracles, whether as a judge, on account of want of evidence, or as a Christian, because they seemed to him in open conflict with the exalted spirit of Christ's own teaching. Yet he remained always a truly devout Christian, trusting more in the great miracle of Christ's life and teaching on earth than in the small miracles ascribed to him by many of his followers."[1]

When we inquire, Did Gifford arrive at any definite first prin-

[1] *Natural Religion*, p. 3 (first edition).

ciples? the answer must be, unfortunately, that nothing extant affords a basis broad enough for judgment. Nevertheless, two Lectures—those on "Emerson" and on "Substance"—offer materials which it is impossible to overlook. From them one may infer that the writer was not only detached from the traditional thought of his country, but was in the habit of formulating something positive for himself. On the whole, these constructive insights belong to the period of preparation, when Natural Theology still held sway and when Philosophy of Religion lay in the future; the period anterior to the rise of Scottish Hegelianism, a time when Emerson and Carlyle prophesied, and when the later leaders, like John Caird, Thomas Hill Green, and William Wallace, were still young. Tendencies attract notice rather than achievements; vision, not *Wissenschaft*, determines speculation; personality carries the day more than principle consciously reasoned out. "The truths of nature," in Gifford's language, "are the ever fresh thoughts of God." The admiration of Emerson is symptomatic in itself. "Twenty-five years ago I heard Mr. Emerson deliver four lectures in Edinburgh. . . . I listened to him with a youthful and overflowing enthusiasm. That enthusiasm I *still feel.*" In the same way, much may be inferred from passages such as these: "Mystery and obscurity are as essentially parts of nature as clearness and definition. It is a great mistake to suppose it the only test of genius to be always clear and distinct and lucid. It is only very narrow genius that is always that. The great man, like the great painter, is great both in light and in shadow. Nature lives in both, and is in perfect *chiaro-oscuro*. . . . In truth, he who does not find mystery and darkness everywhere may rest assured that he has seen nothing as he ought to see it. . . . This cannot be said of Emerson. If he sees the light he is still more conscious of the darkness, and is drawn to it with a strange fascination. . . . Not only is he really a lover of mystery, but he is also *mystical*, that is, he is fond of embodying the unknown, the dimly seen, or the darkly guessed at, in fanciful forms and emblems."

"Line in nature is not found;
Unit and universe are round;

In vain produced, all rays return;
Evil will bless, and ice will burn."

"I gather also that he rather inclines to the higher or subjective pantheism; but he will not limit and he cannot define. Before all such questions he stands uncovered and reverently silent. . . . Is one who occupies this position to be blamed? The thoughtful and magnanimous will not say so. I cannot condemn that wise and humble scepticism, which, while reverently waiting and inquiring, refuses to say what it does not think, or to profess a belief which it does not feel. Let us all be patient and wait."

Notwithstanding this mystical mood, Gifford felt the need for system, or, at least, for reconstruction. Of this the lecture on *Substance* affords ample evidence. "I take the opportunity of saying to you,—Young men, keenly desirous of mental and moral elevation,—Don't neglect Metaphysics! The Science of Mind, and the doctrine of the Unseen and the Universal!" At one point, he almost succeeds in wrenching himself free completely from the dualistic implications with which his intellectual environment was saturated. "If I had time and opportunity, I think I could demonstrate, that in the deepest and last analysis the conception of *substance* is identical with that of *cause*, and that on this conception —a conception, it may be, with a double aspect, substantial and causal—there rests not only the whole structure of philosophy, but the very possibility of religion and piety. So that without the doctrine, the true doctrine, of substance and of cause, philosophy would be a delusion and religion a dream. Just let me say in passing, and I say it with the deep seriousness of profound conviction, that true philosophy and true religion must stand or fall together. If philosophy be a delusion, religion can hardly escape being shown to be a dream. Perhaps as we go on with our consideration of *Substance*, we shall begin to see how truly it is the very foundation-stone." In the following, again, we have a basis for constructive idealism; even if the statement be made as an assumption, it is one which the author evidently believes with the whole force of his strenuous nature. "The substance and essence of a man is his *reasonable* and *intelligent* soul. This is the cause and explanation

of all the phenomena which man presents. . . . The force behind and in all forces, the energy of all energies, the explanation of all explanations, the cause of all causes and of all effects, the soul that is within and below and behind each soul, the mind that inspires and animates and thinks in each mind, in one word the substance of all substances, the substance of all forms, of all phenomena, of all manifestations, is God." Notice, too, the influence of Spinoza, and the conscious recognition of affinity for him. "If God be the *substance* of all forces and powers and of all beings, then He must be the *only substance*, the only substance in the universe or in all possible universes. This is the grand truth on which the system of Spinoza is founded, his whole works are simply drawing deductions therefrom. . . . If this be only one chapter of metaphysics, these metaphysics can be no empty and barren science, but must be fraught with results and lessons as momentous as they are divine."

On the other hand, the tentative character of all the conclusions may be gathered from the unguarded manner in which they are expressed so frequently. "Man generally worships the Phenomenon, the Appearance, the Revelation. But the Noumenon, the Real, the Substance revealed, is withdrawn from his faculties." The same thought, implying a separation between substance and phenomenon, or the possibility that the latter may hide—and so cannot *be*—the former, appears often in the essay on *Substance*. Elsewhere, Gifford approaches more closely to what we hold for true now, as, for instance, when he says: "To understand iron, to get at its substance, we must look to the forces and to the motions, or to both, of its molecules or of its ultimate atoms." Yet, on the whole, the insinuating fallacy of a possible division between substance and its "forms" is never put to utter rout. It could not be at that time; and this is precisely the reason why Gifford endowed Natural Theology, not Philosophy of Religion. The latter was just about to oust its predecessor for ever; yet the dualistic reference, current everywhere in the English-speaking countries twenty-five years ago, and dominant now in many a mind, preserved the ancient nomenclature, but, thanks to Gifford's own experiences,

not the ancient limitations. The broad sweep of a great spirit, overwhelming all artificial bounds, informs the Deed of Foundation of the Lectureships. And, recognising this, the beneficiaries have gone beyond Natural Theology with wonderful unanimity, and have accomplished much to spread abroad the light of that fuller day which the Founder divined but did not live to witness.

No doubt, Gifford's ethical catholicity and largeness of mind were moulded by his wide information in history and poetry, just as his eminence in legal oratory, like the warm brilliance of his style, flowed from his earnest spirit. These passages, prophetic of the complete victory of the historical method, with its enormous stride towards a true "Theopanism," serve at once to justify the transformation of Natural Theology into Science and Philosophy of Religion, undertaken by past lecturers, and to reveal further the manner of man to whom these splendid benefactions constitute a monument so fitting. "The Middle Ages! What strange scenes and pictures do not the words recall? The fortalice of the half savage Baron and the mean huts of his degraded serfs. The proud pomp and spiritual power of the haughty churchman, before which the strength of kings, and the might of feudalism was fain to kneel. The chivalry of Europe drained time after time to furnish forth the armies of the Crusaders. Religious excitements and revivals passing like prairie fires over Europe, and compared with which modern revivals, even the wildest, seem but the coldest marsh gleams. Strange and terrible diseases and epidemics, and plagues both bodily and mental, that mowed down millions as with the scythe of destruction. The spotted plague, and the black death, and the sweating sickness. The dancing mania, the barking mania. The werewolf and the ghoul. Strange mystical schools of Philosophy exciting popular admiration and enthusiasm to us unexampled and inexplicable. And below all, the swelling and the heaving of the slow but advancing tide which even yet is bearing us upon its crest. . . . Even Saint Bernard's tomb has been swept away, and the site of the once famous monastery is now occupied by a district prison. But the work of Saint Bernard still tells upon humanity. He made his mark upon the ages as they passed over his grave,

and the Church long bore the impress of his gigantic spirit. . . . Bernard's asceticism and austerities were not so to speak mere selfish acts, ending on himself as secluded from the world. They were not the mere formalities of the solitary and almost mindless hermit, muttering and moping in semi-idiocy before his crucifix and his skull. Far, far different. They had all relation to his fellow men. Every fibre of him throbbed with sympathy, and every nerve trembled and thrilled to influence and to draw his neighbor; and truly the power and the influence went forth! Perhaps there never was a man who had a greater and more powerful *personal influence* than this Bernard. I am not speaking just now of his preaching, although of course his personal influence was felt in all his preaching. I mean simply the effect which his presence or address produced on all who came near him. His will or his attraction was predominant and irresistible. At the glance of his eye, at the wave of his hand, his enemies wheeled round and joined the ranks of his retainers, as if they had heard the mighty 'follow me' of a greater than Saint Bernard."

The fact is that, whether he knew it or not, Gifford was possessed by a stern passion for truth, ultimate truth. He well knew that nothing great is ever accomplished without passion, but he consumed his own smoke, like a strong man. He tells us that "in all ages, men, the common run and bulk of men, are far more led and swayed by their feelings and habits and emotions than by their understandings. It is not he who sees the highest truth, but he who touches the deepest chord of feeling that can bend the multitude to his will." By this very element of feeling, he swayed his own will, and mastered himself, and thus rose superior to the traditional limitations of his time, making sure that, in the future, his countrymen, when sorely puzzled as he had been, could avail themselves of aids, for which he had longed doubtless, but could not obtain. His benefaction has served, and must go on serving, as a powerful lever for the destruction of the bonds that were his problems. We still see darkly as he did, but, thanks to him in large measure, we see more whole.

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THE DETERMINING OF GENIUS.

AMONG the many critics who have attacked my theory of genius and insanity, only one, Mr. Sergi, has discovered in it a true and capital deficiency. He says in *The Monist* (Vol. 10, No. 1., pp. 85 et seq.), that I succeeded in illustrating the nature of genius, but that I did not explain the existence of its varieties.

He did not mean that geniuses differ essentially in their quality; the nature of genius, whether mathematical or strategic, or literary, is constant and invariable. So calcium carbonate can crystallise either in rhombohedral or hexagonal systems; but its chemical nature is the same in both cases. Explosion, unconsciousness, novelty, intermittence, are common to all forms of genius. But, Mr. Sergi says, their having a common nature does not at all explain why they differ from each other. So the fact that both forms of crystallised calcium carbonate belong to the same chemical substance, does not explain why two forms exist. Water and ice have the same molecular and atomic composition of hydrogen and oxygen, but only a special physical condition of temperature makes them assume the appearance of water or ice.

Now, how can we explain the great variety of geniuses? Why does an artistic genius, an historical, an archæological, exist? This is a new problem, and heredity is not sufficient to solve it.

Sometimes surrounding influences, with predisposition and hereditary transmission, determine the form that genius shall take. So Darwin, St. Hilaire, Raphael, Bach, and the Bernoullis, were born of naturalists, painters, and mathematicians, and lived among

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[1] Translated from the Italian MS. of Professor Lombroso by Felice Ferrero.

them, finding in atavistic tendency and surrounding intellectual atmosphere, the first cause of their later work. But this is not a general rule; on the contrary, geniuses, particularly the scientific, show a tendency to—I might say—*dissimilar heredity*, by means of which sons are as different as possible from their parents. Edgar Allan Poe was a descendant of rigid Puritans.

Sometimes the environment alone and at large, particularly economic and social conditions, causes geniuses to follow their definite bent. Many a great jurist has lived in Italy, where crimes and litigations are very frequent, and warlike Piedmont has been the cradle of many a famous warrior. Among the Hebrews, who were and are great merchants, students of economics are numerous: recall, for example, C. Marx, Ricardo, A. Loria, L. Luzzati. The instance of Ricardo is peculiar; he had no inheritance of genius from his father, nor was he inspired by him; he simply shared in his father's business and speculations, and from commercial practice he drew economic applications, which are generally inspired by a very practical spirit, owing to his previous work and his rise subsequent to great commercial events, such as the monetary crisis of 1809.

But all these facts must be considered with much circumspection, because often it has been the very lack of favorable circumstances that has excited manifestations of genius and caused them to spring forth. Without misery and misfortune we should not now have the novels of George Sand and Harriet Beecher Stowe and the comedies of Goldoni. The history of genius is full of circumstances apparently opposed to its development. Boileau, Le Sage, Descartes, Racine, La Fontaine, Goldoni, were obliged to hide their muse beneath the grave garb of the lawyer and the theologian. Poisson's parents wanted him to become a surgeon; Herschel's and Cellini's meant to make players out of them. Michaelangelo's father wanted his boy to become an archæologist; never—he used to say—an image-scribbler. When a great sculptor saw the lad's first attempt and begged to have him placed in his own studio, Michaelangelo's father exacted of the sculptor a yearly sum for this privilege.

Flaubert was in his childhood intended for a lawyer.

Galileo had among his ancestors, up to 1538, several philosophers, magistrates, and great thinkers (cf. V. Nelli's *Life of Galileo*, 1793). Even his father, Vincent, was an original musician and a student of geometry; his brother Benedict was also a praiseworthy musician. But evidently his heredity had no direct influence on Galileo; nor had his education, because education in those times inclined strongly to rhetoric and classicism,—Nelli affirms that there was then only one school of mathematics and geometry in Tuscany, nor could his medical studies have been of any use to him, because medicine was quite theoretic and without the foundation of experiment.

It appears, then, from the above instances, that hereditary and surrounding conditions, once the causes most commonly assigned, either fail to explain the origin of genius-variation, or are contradictory or insufficient. Nor, to determine the special temper of a genius, is it enough to know the domination of acoustic or visual centers, the vivacity of fancy, the rapidity of synthesis that we discover so easily in his handwriting and style, although such conditions of intelligence have an enormous influence on genius. But a visual genius may become a poet, sculptor, painter, histologist, or calculator; and an acoustic genius may be a musician, or an orator, a poet, or critic, or novelist. This domination is not sufficient to settle the variety of genius. So I believe that there is another factor of utmost importance to which belongs the principal part in this determination, and with which heredity, environment and the peculiar nature of genius are co-operators: that is, according to my opinion—a strong impression received at puberty.

GENIUS AT PUBERTY.

He who analyses biographies of great men will find that in most cases the determining cause of creative direction lies in the combination of individual tendencies, with a very strong sensorial impression made at a time not far from puberty.

While a mere lad, Segantini's genius for painting had already

flashed upon the walls of the Reformatory where he was kept, and where his superiors wanted to make of him, willy-nilly, a shoemaker. Had they encouraged and rewarded him, he would, possibly, have been an able shoemaker, of whom nobody but his customers would have known; but they abused him; then he fled from his wicked protectors to his native mountains, where he became a shepherd. There he used to draw sheep and huts without any particular thought of it. Once—he was twelve years old then—he saw a little girl die, and her mother disfigure herself painfully, because she could not preserve her daughter's image. He was inspired, and made a picture of the child: from that day he was the great Segantini. The combination of strong moral and physical impressions, at the very beginning of puberty, with such a powerful visual talent, made him a genius as a painter.

Proudhon was the son of a wood-cutter; the curè of his parish had taught him a little Latin, and the Benedictine friars of Cluny the elements of drawing. At the age of fourteen, he was trying to copy some bad pictures in that convent, with colors made out of plant juices and brushes of mule hair, when a friar told him that he would never succeed with his strange methods, because those pictures were oil-painted. Such a remark was sufficient to make him find out the secrets of oil-painting by himself, as Pascal did those of geometry. (Gauthiers, 1136.)

Stuart Mill, at the age of twelve, was so deeply affected by studying his father's *History of India*, that his genius and passion for historical and economic events began at that time.

Arago, a lawyer's son, was precocious in music, and took an interest, while a youth, in classical studies. His passion for mathematics burst forth suddenly when an artillery officer told him that he had rapidly reached his position by graduating from the Polytechnic School and studying exact sciences. Then Arago quitted Corneille for mathematics; he studied them by himself, and at the age of sixteen was ready to take the examination for the Polytechnic.

Thomas Young was so precocious that at the age of two he could read, and at five he had learned a large number of English

and Latin poets, whose works he could recite by heart. When eight years old, he once met a land-surveyor, who showed him his instruments to calculate distances and the elevation of far-away bodies; he immediately set himself to study a dictionary of mathematics, to understand the structure of those instruments. He made a microscope by himself, and learned differential calculus in order to comprehend mechanics. (*Arago—Œuvres complètes*, 1854, Volume II.)

Galileo, up to his seventeenth year, made no physical discovery of any consequence; he felt himself inclined to exact sciences and detested the inexactness of metaphysics and medicine. But when at eighteen, in his third year of medical training, he saw in the Cathedral at Pisa a lamp regularly oscillating, he thought suddenly that he could invent an instrument for the purpose of studying the laws of isochronism, and examine the state of the pulse.

Lioy, in Martini's *Primo Passo*, says that he was eight years old, when, at the birth of a little brother, he was shut up in the library to keep him quiet, so that he should not disturb his mother, and a volume of Buffon was given him to read. It was the spark for his genius. "It seems to me as if I saw those birds yet; I dreamed of them all the night long; my place as a coming naturalist was settled."

Darwin, at eight, while he had already a great passion for collecting plants and animals, fancied, or rather, invented, and told to a school-mate, the story that he could change the hue of flowers by sprinkling plants with colored solutions. It was a mere story, but it shows that from those early years he had observed the variability of plants. The germ of that idea, which was to dominate his whole life, was concealed in this puerile fiction that afterwards became a reality. The great English naturalist believes that his having seen at that time a copy of a journey around the world, which greatly interested him, caused him to long for trips to far countries, and to travel, in later days, on the Beagle. On the contrary—he says—school, as a means of education, was simply a cipher to him. (*Vie et correspondence de Ch. Darwin*, 1888, p. 32.)

Poisson (*Arago—Œuvres*, V. III.) was to be, according to his

parents' wish, a phlebotomist; his education was entrusted to an uncle of his who pretended to instruct him by making him puncture the veins of cabbage leaves with his lancet; he was always making mistakes. But at eight or nine, he once saw a programme of the Polytechnical School and noticed that he could readily solve some of its problems: his career was discovered and his future settled.

La Fontaine was the son of an official, a poor verse scribbler. His genius was revealed when his attention was attracted to Malherbe's beautiful poem on Henry IV.'s death. Then he knew that he could be a poet, and such he was.

Gianni (*Universal Biography*) became a poet when first he read Ariosto. Then he made *extempore* verses, before he had learned the art of composition, shortly after puberty.

Lagrange had no great aptitude for study; his mathematical genius appeared when, as a high school student, he read one of Halle's writings; he wrote then his first essay on the calculus of variations.

Benjamin Franklin was the son of a mechanic. At eleven, he had to leave school, and, to earn his living, entered a soap factory, and later a printing-house where he could learn something. Having noticed for the first time the discharge of an electric spark in a toy machine, he imagined that lightning had the same origin, and discovered the theory of lightning and the lightning-conductor.

In all these cases, sensation did not rouse genius, but was the occasion of its revelation, and determined an individual who was organically predisposed, to turn to an end from which circumstances, education, etc., tended to take him and to separate him permanently.

So Darwin was predisposed by atavism to great naturalistic synthesis, because several of his ancestors had already worked in that direction, and his wit gave precocious proof of such predisposition in his idea of getting artificially colored plants. But, according to his own declaration, all the education he received was of no help to his later studies. The voyage of the Beagle was the point of departure for all his creations, and the intense wish for that

came to him from reading, at puberty, a book on a trip around the world (*Correspondence*, 1878).

Sir William Herschel was a player who had learned by himself languages and mathematics, without any special end in view. His having seen, at twenty-one, the field of the sky through a telescope, struck him so forcibly that he made a telescope himself, and was driven to study which metal alloy was the best reflector of light. The result was, that by the age of thirty-six he had achieved the construction of a great new telescope.

Lalande, a pupil of the Jesuits, composed dramas and novels at the age of ten; later, he aimed to be an eloquent lawyer: but when an astronomer made him observe the great eclipse of 1748, he felt his passion for astronomy, and became an astronomer, too; he was sixteen years old at that time.

Boerhave was intended to be a clergyman, and he took his degree of divinity. The idea of curing an ulcer that vexed his hand, roused in him his first passion for medicine.

Lalande, Lagrange, Young, thought of themselves as classical, literary men, until either astronomical instruments or demonstrations in geometry came accidentally into their hands; and Gianni, a stays-maker, became a poet after reading Ariosto's poems.

In some cases, however, the tremendous effect produced by the first impression, as in Guerrazzi, shows that a true transformation happened, owing to a sensorial impression at puberty; should such a sensation have been wanting, genius would never have developed. Guerrazzi writes:

"I must note an event which may be considered an epoch of my brain. My lot at that time, when I was twelve years old, brought Ariosto into my hands. My mind, made like the strings of a harp, to be moved by vibrations of beauty, and constrained, thus far, into the hateful coils of grammar and of convent-life, plunged into the joys of Ariosto's poems. Every man wishes for the paradise of his own fancy; to me the spirit of those times was a paradise and Ludovico was master. I used to dine with my *Orlando Furioso* by the bread; to sup, in the same way; and father had to put out all the lights in order to get me to bed. I don't know what my value is; my descendants will see that; but if I am worth something, I owe it to Ariosto." (*Autobiog.*, 1900.)

Here we can see the clear expression of the dynamogenous, fermentative capacity of a certain impression on a man of genius, during his pubescence, even in spite of his education's having pushed him in a direction contrary to his own innate tendencies. A last instance is offered by Galileo, whom his education drew in the way of classical, or musical, or medical studies, as we stated above; he felt inspired to mathematics and astronomy at the sight of a pendulum. This is a most characteristic example, because new applications of the pendulum kept occurring to his mind all through his life, to the very end. At first, when he was a medical student, in 1583, he applied it to pulse-measurements; then, when he interested himself in astronomy, to star and time-measurements —as one may read in a letter of his; and finally, in 1641, at Reagli, blind and near death, he thought that the idea could be applied to clocks—as is proved by a letter of Viviani—and only his blindness, which caused his drawings to be formless, and his death, prevented him from completing the work he had started at seventeen at the sight of the swinging lamp in the cathedral of Pisa. (Nelli's *Life of Galileo.*)

To many a genius the first impulse has been given by feminine beauty. Petrarch, at the age of fourteen, was drawn to poetry and a life of genius by the first sight of Laura. He wrote afterwards, April 6, 1327: "I don't deny that the little I am worth I owe to that woman, and that if I enjoy some fame or glory, it would never have been, had she not cultivated with so noble affections the little seed of virtue nature placed in my soul."

Nencioni tells us that his first poems, at twenty, were inspired by the sight of a very beautiful maid. De Amicis lately stated that one of the most brilliant writers of vernacular poems in Piedmont had not yet written a line at twenty-two, when he fell deeply in love with a lady of prominent position; some time afterward he met her in a railroad car, and in a moment when all the lights were accidentally extinguished, he felt her hand gently pressing his and knew that his passion was accepted and returned. A few hours later, he wrote the best of his poems, "A Shepherd's Dream," and was always, thereafter, a very able poet.

Dante declares in his writings that he was inspired by his meeting with Beatrice in his early youth.

Burns, a shepherd, who was already inspired by his mother's popular songs, wrote his first poem at fifteen, for love of a young girl.

Sometimes religious passion takes the place of erotic excitement. Lacordaire was roused by his first communion, and Rapisardi relates that, at thirteen, an ode to St. Agatha started the long series of his poems.

The great essential in these instances is that they all belong to childhood or pubescence. Now, men are undergoing external influences and strong sensations at any time, but without such a reaction as they show at puberty. Puberty has a tremendous importance for one's mental development, on account of its greatest impressionability to external causes. Youth is then in a condition of latent explosibility, ready to burst out under the pressure of every influence, whether of scientific theories, or of artistic enthusiasm, or of misfortune, or of strife. Adult man is thrown into the midst of new surroundings, new habits, new individuals, but they do not find such a quick echo in his soul, because his way is settled, he has sentiments and ideas of his own and may hardly be influenced.

A very important proof of this truth appears in Starbuck's *Psychology of Religion*. The author personally investigated the cause of conversion of many hundred students in seminaries and upper schools of America, with the following results:

	WOMEN	MEN
By parents	23 cases	32 cases
By familiar surroundings	30 "	52 "
By friends and acquaintances	34 "	42 "
By ministers	23 "	20 "
By teachers	0 "	6 "
By writers	17 "	17 "
By science	3 "	8 "
By art, music, poetry	8 "	15 "
By books	10 "	12 "
By deaths	0 "	13 "
By misfortunes	0 "	2 "
By internal struggles	0 "	0 "

He noticed that besides a more general influence on the part of parents, a very large proportion of influence was exercised by friends or teachers at particular times of life; or tales, sermons, poems, songs, listened to, or read, under particular circumstances, —these factors contributing to conversion as frequently as familiar surroundings. But in all these cases, this is the fact of actual interest to us, that any external influence, through friends, books, teachers, etc., acted, as the case is with genius, at puberty, during a period extended by Mr. Starbuck to six years, by including years immediately preceding and following puberty, the psychical and physical influence of which was found by him to last much longer, especially in the case of men. Indeed, it is evident from a graphic representation of his observations that the line representing the number of men's conversions in relation to their ages has three *maximums*, one at sixteen years, another at twelve, and a smaller one at nine. This curve is exactly parallel with Harnack's, for mental tests, in order to fix a maximum of intelligence, or, better, of reasoning power, in boys of the same country.

Mr. Starbuck gives also in his book many answers he got to his questions, and such answers show that influences were—as stated above for genius—momentary, enormous, as revelations quite out of proportion to events, having nothing peculiar in themselves. Some young men were converted after listening to the serious preaching of a friend or teacher they had known and loved and listened to, even before; or after reading a book, a story, a quotation, they had seen hundreds of times; hearing music, or witnessing a pitiful sight that had nothing worth notice in itself, but which agreed at the time with their particular condition of soul.

The same sort of thing occurs in the unseen, inner life, according to Mr. Starbuck's statement. Most of the men interviewed by him had noticed at some moment of their childhood a sudden revolution which determined a violent change in their characters, ideas and aims,—a transitory period of folly, he calls it. For many of them such a revolution was the cause of terrible melancholy; for others, of ferocious scepticism, or stupid passions.

Mr. Marro pointed out something like this in Turin schoolboys who become riotous, undisciplined, and bad at about twelve or thirteen years. (Marro's *La Pubertà*, second ed., 1900. Anthrop. Series, Vol. XXVI., Bocca Bros., Turin, Italy.) The result of an investigation of mine, attempted among forty educated young men, is that, at that time, impulsive, pyromaniac, kleptomaniac, and strikingly ambitious tendencies are very strong and diffused, sometimes even with slight hallucinations, and almost always with megalomaniac tendencies and demency alternated. Out of forty examined, sixteen declared that they noticed nothing or recalled nothing; seven remembered having, between eight and twelve years of age, a strange megalomania, in opposition to their family circumstances, to become conquerors of Verne's Islands or the Republic of San Marino; five stole at home in order to waste money, —they were workmen's sons and tried to make people believe that they were rich and powerful; five had persecuting ideas of being arrested by the police, or of becoming soldiers, when they were eight years old; three were insulting, quarrelsome, and villainous; two were seized by religious mania to become missionaries or hermits; two had obscene impulses, and one a suicidal tendency. A rich, very honest, young man, during pubescence, stole even coin pieces from shops, though he was not in need, and threw them away, or concealed them underneath stones, as soon as he had taken them. Another rich man had stolen a pair of shoes from a show-window, only to throw them away.

A lady-teacher in a Turin boarding-school told me that she had to look after three sisters, who successively attended her school; and that all of them were good and quiet up to twelve years, became intolerable liars, bad and insubordinate, from twelve to fifteen, and later resumed their previous character.

The fact is, that at that time a tremendous overflow of life is prepared and organised and perturbs the being, enveloping it as in a sort of coil, which can—at least temporarily—drag the feeble to their ruin, but exalt the strong to giddy heights; because at this age of complete reconstruction and transformation of the organism, the psychical centers are the most affected. This proves the truth

of a great writer's sentence, that he who never created anything in his youth, will never create anything later. Now, in this giddy movement it is natural that any most energetic, though formerly latent, activity, breaks its way, particularly when the electric shock of a special sensation has first thrust it in that direction toward which it naturally tended. So a fertile coupling happens that definitively polarises young people and causes a new organism of greater proportions to develop.

What happens transitorily in normal people would happen on a larger scale in geniuses; such an organic revolution is more pronounced and more manifest in the latter, as well as in criminals and the insane. The insane indeed show, above all in their psychopathies, a keen resemblance, almost an identity in the process of the formation of mad intellect, with that of genius ideas in men of genius.

Sometimes, although psychical activity is normal to a great extent, an impression received by an individual during, or shortly before, puberty, assumes such a great importance in him, as to determine all his actions, all his psycho-sexual content. Such is the case of those so-called *erotic fetishisms*, of people who can be sexually attracted only by seeing an old woman with a coif, or by holding a candle in the hand, or by being insulted, etc., that can be explained by means neither of atavism nor of neurosis. When those people are questioned, however, one learns that in the very moment of their first erotic excitement they were so powerfully struck by the image of an old woman with a coif, or with a candle, that they could be roused in no other way. A man who felt an erotic fetishism for women dressed as Italian models, recalled, in explanation of the fact, that he saw, while sixteen years old, in the first power of his puberty, a model of extraordinary beauty so dressed.

This is a phenomenon which is also common to genius, certainly owing to its degenerative character, by which the process of erotism remains crystallised in one of its first periods of sensorial excitement. Any one normal in his erotic passions is first excited by the sight of some feminine belongings; but in those abnormal

cases this moment absorbs the whole erotic process: so that the lover of a model's dress, above spoken of, no longer needs to see her face, or wants her to speak to him, to touch him, the first moment of excitement so wholly substituting itself for all the successive ones that the latter may be suppressed.

Even in many cases of hereditary paranoia a like phenomenon is observed, which explains some strange deeds normal and pathological psychology are quite unable to interpret. Individuals who received a strong impression in a particular circumstance were affected all through life by it, exclusive of others, although their *psyche* was altogether unchanged. Mr. Marro speaks of a girl who, upon hearing a man talk a long time on some parts of the body, felt a deep horror, became a maniac, and continually fancied men speaking of that matter. A girl was so impressed by a volcanic eruption that thereafter she believed herself to be always in the midst of volcanoes, and another was so frightened by a quarrel in a *bal-masqué* that always afterward she saw people with masked faces. De Quincey is the most typical case; having seen, when he was six years old, his dead sister lying on her death-bed, he was so struck by the sight that the sky and the clouds always seemed to him full of beds with dead girls in them; these visions lasted for the greater part of his life, so that he said himself that all our ideas exist as germs in the child, and chance—an accident, futile in itself, but decisive—causes them to develop.

THE FACTOR OF AGE.

Sometimes one notices that the influence on the creation of genius, as well as the determination of folly or religious conversion, did not concur with the time of puberty, but happened even long before as in De Quincey. That is clear, when it is understood that what we said must be applied to a longer period than that of puberty itself, and extended to years immediately following and preceding it. Some geniuses are so strangely precocious that infancy and youth are confused in them. Mozart was a composer at five; Gassendi, a preacher at four; Picodella Mirandola knew several

languages at ten, and Kotzebue wrote his first comedy at three. This precocity is often shown by Negroes and Esquimaux, and is evidently a degenerative characteristic, as criminals present it (31–45 per cent. of the cases); female offenders have their menstruation even two years earlier than the average.

SLOW IMPRESSIONS.

Sometimes, on the contrary, the fertilising impressions of genius are received, apparently, much later than at puberty. This is explained by the fact that circumstances prevented fertile contact from taking place, or such contact found a quite unprepared individual and was therefore unfruitful. Starbuck noticed some instances of slow conversions after thirty, but these cases happened when extreme poverty or extraordinary "family circumstances," obliged the individual to busy himself with the most pressing questions of life, and to compress every aspiration for great ideals.

So Caxton, born of very poor parents, growing up in the want of any education when a boy, was employed by a merchant who later became Lord Mayor of London. He acquired thereby great confidence, and was sent to Holland as a representative of the Merchant's Association; there he had occasion to hear about Gut tenberg's invention and that was enough to make him an inventor in this line.

In some of these instances the influence of puberty was a most important one, but stayed latent; it did not at once determine, but prepared for the bursting out of a genius's vocation, which happened only later, under other circumstances. Thus, Lacordaire received so deep an impression from his first confession at seven, that he preached on it in a touching way in a private chapel to his relatives, and recalled that time, many years later, as the germ of his career. When he was twelve years old his religious fervor was reborn in his first communion, which—he says—was the utmost joy of his life; after that he studied, became a lawyer, and had great success, when at twenty he was suddenly overtaken by religious enthusiasm which caused him to make a priest of himself. Evi-

dently, although he came to a decision only when an adult, his greatest incitement came to him in his earliest puberty.

Berlioz had already composed a *pastorale* at twelve; then he had his head stuffed by his father with classics and medicine. At fourteen he felt again his love for music, because of some operatic musical sheets which occasionally came into his hands; but although a musical fermentation was working in his brain, he kept on studying medicine and anatomy. Only at seventeen, when he listened to a performance of *Le Danaidi*, did he begin to hate everything that was not music, and lost his sleep over it; then he resolved to leave his medical studies and became the great composer. Unconscious influences acted, in such a case, before and at puberty, worked concealed for years, and burst out under a fortuitous circumstance, long afterward.

Therefore, while society cannot be held absolutely responsible for births of genius, because too many independent factors are required for its formation, it must be held responsible in so far as it has a great influence in causing genius to take a direction and follow a line, because almost all of the deep impressions which strike a boy in his puberty are excited by the environment which surrounds him. That is why great geniuses of Italy were for a long time bound to classicism and painting; as in the Hebrew race they were bound to mathematics, philosophy, and political economy: in Piedmont, particularly to war; in Germany, to commerce and industry; and in America, to inventions and practical applications. If business or military glory, or something else, be a constant and general tendency of a people's spirit, the impression thereof which strikes a boy of genius, will cause him to be an Edison rather than a Galileo; a Ferrari or Titian rather than a Stanley.

That is why I am opposed to the Italian classical education that presents to the minds of the new generations useless or dangerous examples, instead of practical instances, whereof the imitation could place Italy on the same footing with other nations. That is why I endorse and heartily support technical, scientific, professional, and, above all, industrial education. Such an education would give any born genius or talent the same opportunities and

chances to work at building up national wealth and strength, as it does in America and Germany, where the genius of industry and commerce is in its full bloom, although the genius of science and art may be declining.

CESARE LOMBROSO.

TURIN, ITALY.

ON THE NECESSITY OF ATOMIC THEORIES IN PHYSICS.[1]

IN addition to the atomic hypothesis now in vogue, there is a second method employed in theoretical physics which seeks to represent the facts of some given and very narrowly circumscribed domain by means of differential equations. We shall call it *mathematico-physical phenomenology*. Since this method offers a new constructive representation of the facts, and since it is of advantage to possess as many such representations as possible, unquestionably the new doctrine is qualified to take rank beside the atomistic hypothesis in its present form as a method of great value and utility. Another form of phenomenology, which I should like to term the *energic phenomenology*, will claim our consideration later.

Now, the opinion has grown rife that our representations of nature as drawn from phenomenological considerations enjoy intrinsic advantages over our representations as obtained by the atomistic method. It is my wont to avoid general philosophical discussions of this character, where there are no practical consequences at stake, for the reason that they do not admit of the precise formulation that special questions do, and consequently their solution remains largely a matter of taste. But I have the impression that the doctrine of atomism has, for the rather untenable reason above adduced, recently been fast losing ground, and I have therefore felt constrained to do what is in my power to avert the

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[1] Translated by T. J. McCormack from the *Proceedings of the Imperial Academy of Sciences of Vienna*, Vol. CV., No. 8, Section of Mathematics, Astronomy, Physics.

injury that I believe would result to science if phenomenology should be made a dogma, as atomism once was.

To avoid misunderstandings, I shall declare it at the outset to be the purpose of the following discussion to answer certain quite definite questions. And since the services that atomism has performed for science cannot possibly be a subject of doubt, these questions may be formulated as follows:

(1) Has not the atomic theory in its present shape distinct advantages over the phenomenologic theory now current?

(2) Is there any likelihood that there shall develop from phenomenology in the near future a theory possessing precisely the advantages which constitute the distinctive features of the atomistic theory?

(3) Granting the possibility of the atomic theory's being eventually discarded, does not the equal possibility exist that gradually phenomenology may become absorbed in the atomic theory?

(4) Finally, would it not be a positive detriment to science, if the reigning views of atomism did not continue to be cultivated with the same ardor as the views of phenomenology?

I may state at once that the outcome of the following reflexions will be to answer the foregoing questions in favor of atomism.

The differential equations of mathematico-physical phenomenology are obviously nothing but rules or directions for constructing and combining numbers and geometric concepts. But these numbers and concepts are themselves nothing but mental constructs from which the phenomena of nature may be predicted;[1] and such is precisely the case also with the constructs of atomism, so that for my part I can discover not the slightest difference between them in this regard. Indeed, to my mind and feeling no direct description of a comprehensive domain of facts, no single and exclusive mental representation of it, at all, is possible. It is accordingly wrong to say with Ostwald, "Thou shalt make unto thee no mental image or likeness whatsoever," but one may merely

[1] Compare Mach's *Principien der Wärmelehre*, Leipsic, J. A. Barth, 1896, p. 363. Mach's writings have contributed much toward shaping my philosophy.

say, "Thou shalt give to such images the fewest possible arbitrary features."

Mathematico-physical phenomenology often combines with its preference for the differential equations a certain disparagement of atomism. But it is my conviction that there is a vicious circle running through the reasoning that the differential equations transcend the facts in less degree than the most generalised form of the atomistic conception. Of course, if we are antecedently of the opinion that our sense-perceptions are mentally representable by the simile of a *continuum*, the differential equations will not, and the atomistic conceptions will, transcend our preconceived opinion. But quite different the case if we are wont to think atomistically: then the situation is reversed, and the conception of a *continuum* appears to transcend the facts.

Let us analyse, for example, the import of Fourier's equation for the conduction of heat, which has become classic in this regard. This equation is merely the statement of a rule, consisting of two parts:

(1) Conceive in the interior of a body (or, more generally, regularly aranged in some correspondingly bounded three-dimensional manifold) a large number of tiny things (call them elementary particles), each of which at the outset has any temperature you please. After the lapse of a very small interval of time (or on a very slight increase of a fourth variable), let the temperature of each particle be the arithmetic mean of the temperatures which the immediately surrounding bodies previously had.[1] After a like interval of time, repeat this process; and so on.

(2) Conceive both the elementary particles and the minute intervals of time to diminish constantly in size and their number to increase in a corresponding ratio until thermometric results are reached of sufficient accuracy to render the influence of further diminution inappreciable.

Likewise, the definite integrals that give the solution of the differential equations, can in general be evaluated only by mechan-

[1] Mach, *loc. cit.*, p. 118.

ical quadratures, or, in other words, themselves first require decomposition into a finite number of parts.

Let no one fancy he has attained a clear comprehension of what a continuum is from the mere utterance of the word *continuum* or merely by writing down a differential equation. On closer scrutiny, the differential equation will be found to be merely a statement of the fact that at the outset a finite number of things is to be held in the mind; this is the condition precedent of the entire process; not until afterwards is the number of the things increased until further increase is without influence on the result. Of what advantage is it now to suppress the postulate requiring us to conceive large numbers of individual things just after we have in our explanation of a differential equation defined by means of that postulate the value expressed by that equation? I may be pardoned the rather hackneyed expression if I say that the person who imagines he has cast off the thrall of atomism by differential equations does not see the woods for the trees. And as for explaining differential equations by complicated geometrical or other physical notions, this would be an out-and-out presentation of the subject in the light of an analogy, instead of a direct description. In point of fact, we are unable to distinguish the adjacent parts. But a constructive image in which we were unable to distinguish the adjacent parts at the very beginning, would be indistinct; we could not perform the prescribed numerical operations with it.

In declaring, therefore, a differential equation, or a formula containing definite integrals, to be the most appropriate representation of the facts, I am surrendering myself to an illusion if I fancy that in so doing I have eliminated the atomistic conception from my mental representation, without which conception the notion of limit is meaningless; I am rather merely making the additional assertion that to whatever degree of refinement our means of observation may be pushed, there will be no noticeable differences ever discovered between the limiting values and the facts.

Does not that constructive representation which assumes a very large but finite number of elementary particles, transcend the facts far less than such an implication? Is not the situation com-

pletely reversed? Whereas formerly the assumption of atoms of a definite size was regarded as a crude and arbitrary theory passing unnecessarily beyond the facts, now that assumption appears the more natural one, and the assertion that there will never be differences discovered between the facts and the limits for the reason that such have never hitherto been discovered (perhaps not once in all cases), adds to the representation something new and undemonstrated. Why the representation is made clearer, or more probable, by this adscititious and supplemental assertion is incomprehensible to me.[1] Atomism appears to be inseparable from the notion of a continuum. Laplace, Poisson, Cauchy, and the rest evidently proceeded from atomistic conceptions for the reason that inquirers were at that time more perfectly aware of the fact that differential equations were only symbols for atomistic conceptions, and that they therefore felt more vividly the need of simplifying these conceptions.

Like the equation for the conduction of heat, the fundamental equation of elasticity can in general be solved only by first conceiving a finite number of elementary particles which act on one another according to certain simple laws, and by subsequently seeking the limit after augmenting the number. This limit is thus again the real definition of the fundamental equations, and that representation of the facts which assumes at the outset a large but finite number of things, again appears the simpler.

We may obtain thus, by investing the atoms in question with as many properties as are necessary to describe a small province of facts in the simplest manner, a special atomistic system for every province of facts,[2] which, whilst it is in my opinion as little

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[1] Our sensations of sight correspond to the excitations of a finite number of nerve-fibers, and are thence doubtless better represented by a mosaic than by a continuous surface. The same holds true of the other sensations. Is it not more probable, therefore, that the models representing complexes of sensations are more fitly composed of discrete parts?

[2] If Hertz is consistent, he can assign to his statement that a definite system of differential equations constitutes his theory of electro-magnetic phenomena, no other meaning than that he thinks these phenomena under the image of two heterogeneous intellectual entities filling space and having both the characteristics of vectors, the variation of which in time, here with reference to intensity and direc-

a direct description as that which is commonly called atomism, is yet a representation of the facts as devoid as can be of adscititious elements.

Now, phenomenology endeavors to combine all these atomistic constructs without previously simplifying them, in order to de-

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tion, is, as in the conduction of heat, determined solely by the immediate environment, but is dependent on the same in a more complicated though readily assignable manner. We have given in this an atomistic theory of electro-magnetism, which contains as few adscititious elements as possible. The demand that this domain shall be explained mechanically, is but another expression of the need of simplifying the construct representing it and of rendering it homogeneous with the constructs representing the facts of the other departments. It is to this lack of homogeneity, which does not impress one on merely comparing the differential equations superficially, and to the probability that simpler constructs exist, that people doubtless wish to give expression when they say we do not know what electricity is.

The ordinary equations of the theory of elasticity, when additionally involving the displacements u, v, w, and the elastic forces X_x, X_y . . . ., represent (if the meaning of the notion of limits be recalled) pretty complicated rules for the variation of the coördinates $x+u$, $y+v$, $z+w$ of ordinary points, and the simultaneous variation of vector-atoms. Even the equations which arise after elimination of the elastic forces, are in need of some reduction before they yield the customary atomistic construct of elastic phenomena. To obtain the latter, certain combinations and decompositions of the equations or of the constructs representing them have to be performed, just as in mechanics forces have to be composed and decomposed in order to obtain as simple a description as possible.

Likewise, differential coefficients with respect to time impliedly require that in our mental construct of nature time shall be conceived at the outset as decomposed into very small, finite portions (time-atoms). If I relinquished, therefore, as unsubstantiated by experience, the view that deviations can never be discovered from the limit to which the construct approaches as the time-atoms are diminished in magnitude, I should be forced to the contention that even the laws of the mechanics of a material point are only approximately correct. Just to give some slight idea of the variety of the constructs at our command, I shall sketch forth here one special example of the representations in question.

Conceive in space (or better, in a tridimensional manifold) a large number of spheres in contact. The arrangement of these spheres varies, in accordance with a law A still to be determined, very slightly from one time-atom to another, but nevertheless by a finite amount. The variously formed interstices between the spheres take the place of the atoms of the old construct, and the law A is to be so chosen that the variations of the interstices in time shall furnish a theory of the universe. If it were possible to discover such a construct, which exhibited more homogeneity than the usual atomism, its title would be established by this fact alone. The conception of atoms as material points, and of forces as functions of their distance, is thus in all likelihood a provisional view, which for lack of a better must still be retained.

scribe the facts as they actually are, that is, to bring into conformity with them all the conceptions contained in these various atomistic theories. But, forasmuch as they introduce a multitude of notions gathered from many narrow provinces of facts, not to speak of a host of differential equations of which each, despite varied analogies, furnishes its own quota of idiosyncracy, it is to be antecedently expected that the description will assume an extremely complicated form. In point of fact, it appears that enormously complicated equations, utterly lacking in synoptic features, are requisite even when phenomenology attempts to describe the concatenation of some very few provinces of phenomena where the processes are virtually stationary (say, elastic deformation accompanied with heating and magnetisation, etc.). Furthermore, hypothetical features, features transcending the facts, must perforce be introduced when it is attempted to describe, for example, the dissociation of gases with Gibbs, or that of electrolysis with Planck.

Then there is the additional consideration that all the concepts of phenomenology have been derived from approximately stationary phenomena, and will not hold for turbulent motions. For example, we may define the temperature of a quiescent body by means of a thermometer inserted in it. If the body move as a whole, the thermometer may move with it. But if every element of volume of the body have a different motion, the definition is rendered nugatory, and it is then probable, or rather possible, that the different forms of energy (as to what is heat and what visible motion) can no longer be sharply distinguished.

If this be borne in mind, and account be also taken of the complications which the phenomenological equations assume even in the few instances where the concatenation of several provinces of phenomena is to be described, we shall obtain some conception of the difficulties encompassing the description by this method of turbulent phenomena in general, especially such as are accompanied with chemical changes, that is to say, of describing them without previously harmonising by arbitrary simplifications the various atomistic theories appertaining to the several provinces.

A special phenomenology, which I shall denominate the *energic*,

in its widest acceptation seeks to bring some sort of harmony into the atomistic theories appertaining to the different fields, by ascertaining what features are common to them. Two classes of such features are known. To the first class belong certain general theorems, like the conservation of energy, the principle of entropy, etc., general integral theorems as I might term them, which hold good in all provinces. The second class consists of analogies which pervade a great variety of provinces. These are largely nothing more than a similarity of form which certain equations always assume at a certain stage of approximation, whilst in more minute details the analogies would frequently appear to fail.[1] Yet, in spite of the enormous importance of the integral theorems, which is owing to their universal validity and the high degree of certainty that flows therefrom, and in spite of the importance of the analogies, which is due to the advantages in computation and the new points of view they offer, both integral theorems and analogies furnish a small fraction only of the entire range and compass of the facts. Inquirers were compelled, therefore, in order even to describe exactly single domains, to introduce additionally so many special constructs (the natural history of the domain), that they could not obtain, as I believe I have shown elsewhere, a single unequivocal and comprehensive description of any one department of stationary phenomena by this method, let alone a synoptic view of all, or, worst of all, of turbulent, phenomena. The question whether comprehensive representations of nature will ever be obtained along this line, has therefore a purely academic value.

To reach this latter goal, the current atomistic theory is seeking to bring the fundamental features of the various phenomenological atomisms into better conformity with one another, by arbitrarily extending and curtailing the properties of the atoms required in each province, and thus rendering them suitable for the simul-

[1] Approximate proportionality of slight changes of the function to changes of the argument, the remaining of the first and second differential quotients with approximately constant coefficients, linearity with respect to small quantities and consequently superposition. So, too, the analogies in the behavior of the different forms of energy appear in part to have such purely algebraical sources.

taneous description of several provinces.[1] It decomposes, so to speak, the properties of the atoms required for a single province, into components (see p. 70, footnote), rendering them applicable to several provinces. Naturally, as in the case of the decomposition of forces into components, this is not possible without some violence and transcension of the facts.[2] In compensation, however, it enjoys the advantage of offering a simple and synoptic representation of a far greater mass of facts.

Whereas phenomenology stands in need of distinct and largely unallied constructs even for the mechanics of the movements of the centre of gravity and of rigid bodies, for elasticity, hydrodynamics, etc., the present atomic theory forms a perfectly apposite representation of all mechanical phenomena, and in view of the compactness of this province it is hardly to be expected that phenomena will yet be discovered that do not fit into the frame of the system. The atomic theory also embraces the phenomena of heat.

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[1] I do not mean to say by this that the phenomenologic equations have always preceded the advances made by modern atomism in point of time. As a fact, most of the phenomenologic equations were reached by the consideration of specialised forms of atoms taken from another province (mechanics), and did not acquire until subsequently, by being stripped of these considerations, the character of phenomenologic equations. This circumstance cannot surprise us when it is known that these equations in reality always involve the supposition of atomistic constructs, and it can therefore only tell in favor of atomism.

[2] One property of this sort arbitrarily introduced into our conception of atoms is their unchangeability. The criticism that we are concerned here with an unwarranted generalisation of the merely transitory unchangeableness of solid bodies, would be justified if we attempted, as was formerly done, to prove the atoms unalterable, *à priori*. We have introduced this property into our conception in order to render it capable of representing in aggregate as many phenomena as possible, just as we introduce into the equation for the conduction of heat the first differential coefficient with respect to the coördinates, in order that it may conform to the facts. We are ready to relinquish unalterability in all cases where another assumption would more fitly represent the facts. In reality, the vector-atoms of the ether mentioned in the footnote on page 70 would not be unalterable with the time.

The unalterability of the atoms belongs thus to those conceptions which have proved themselves of great service, although the metaphysical considerations by which they have been reached cannot stand before unbiassed criticism. But it is precisely owing to this serviceability that we are forced to grant at least the probability that radiant energy so called admits of representations by means of constructs similar to matter (that the luminous ether is a substance).

The fact that this latter circumstance cannot be definitely demonstrated, is due to the difficulty of calculating the molecular motions. In any event, all essential facts may be rediscovered in our theory, which has also proved itself extremely useful in the presentation of crystallographic facts, of the constant proportions of masses in chemical combinations,[1] of chemical isomerisms, of the relations between rotation of the plane of polarisation and chemical constitution, etc., etc.

Then, again, the atomic theory is susceptible of still greater development. We are at liberty to conceive among the atoms individuals endowed with any sort of properties, as, for instance, the vector-atoms, which, as we saw in the footnote on page 70, yielded for the time being the simplest description of electromagnetic phenomena.[2]

As to the turbulent phenomena which are as yet entirely inaccessible to phenomenology, the attitude of atomism toward these is admittedly one of definite preconceptions; yet in compensation for this bias, it offers valuable clues for the most likely modes of presentation of the phenomena, nay in many cases even enables us to predict them. Thus the theory of gases is able to predict the course of all mechanical and thermal phenomena in gases, even in

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[1] No chemical combination is produced instantaneously; each is propagated in space with a finite, though great, velocity. Applying therefore the analysis of the notion of continuity above presented, Mach's and Ostwald's theory of chemism will be found to assert that in each instance a elementary particles of one substance and b of another disappear, while c of a new substance make their appearance. The difference between this and the current conceptions of chemistry is manifestly not very essential. Nothing material would be altered if the limit as usually found should be made to represent the facts.

[2] If by a mechanical explanation of nature be understood one reposing on the present laws of mechanics, it must be declared to be altogether problematical whether the atomic theory of the future will be a mechanical explanation in the sense defined. Only in so far as it shall be under the constant necessity of supplying the simplest possible laws for the time-variation of numerous individual entities distributed in a manifold of probably three dimensions, may it be termed, at least in the traditional sense, a mechanical theory. For example, should no simpler description of electromagnetic phenomena be actually forthcoming, then the vector-atoms mentioned in the text would have to be retained. Whether the laws according to which these vary with the time are to be termed mechanical or not, depends wholly on our own taste.

the case of turbulent motions, and so affords indications as to how temperature, pressure, etc., are to be defined for these phenomena. Now this is precisely the chief end and purpose of science, so to shape the constructs representing one group of facts that from them may be predicted the behavior of other similar facts. It is understood, of course, that the prediction is afterwards to be checked by experiment. Probably it will be only in part confirmed. There is then hope of so modifying and supplementing the constructs that they will conform also to the new facts; which is tantamount to making new discoveries with respect to the constitution of the atoms.

Unquestionably, the demand is justified that no more adscititious elements (and even these are to be as general as possible) shall be added to the construct than are absolutely necessary to describe extensive provinces of phenomena, that we shall always be ready to modify the construct, nay, even to bear in mind the possibility that it might be advisable to substitute an entirely new and utterly different one in its place. And for the very reason that the construction of the new construct would have to be effected on the basis of the old special phenomenologic constructs that have remained intact, therefore these also are to be carefully cultivated by the side of atomism.

In conclusion, I am inclined to go so far even as to assert that it is of the very nature of a construct, that it should introduce certain arbitrary features in its attempts at representation, and that strictly speaking one transcends experience every time one infers from a construct conforming to a given set of facts a single new additional fact. It is mathematically certain that, in order to represent all the facts, we should not be permitted to put in place of Fourier's equation for the conduction of heat an entirely different equation, identical with Fourier's only in regard to facts previously observed, with the result that on the first new observation made we should have to alter our construct utterly and with it our entire conception of the interchange of heat among the smallest particles. All bodies hitherto investigated, for instance, might accidentally

exhibit just that particular group of regularities with the absence of which Fourier's equation would be rendered nugatory.

Just as Fourier transferred to the smallest particles (atoms) the law of specific heat and the fact that the interchange of heat between bodies in contact is proportional to the difference of the temperatures, so the theory of gases transfers to these particles the general laws of mechanics and the fact that bodies in close contact displace one another, but at some distance do not do so. With these smallest particles we cannot, as we see, dispense, when considering bodies of any size.

So, too, the assumption that the same atoms suffice for the description of both the liquid and gaseous aggregate states, appears to me, in view of the continuity of these two states, to be well founded, and conforms admirably with the requirement of simplicity in our description of nature. Granting the reasonableness of the two foregoing assumptions, we cannot escape the conclusion that the atoms are impressed with relative motions invisible to the eye, which absorb visible kinetic energy and the perceptibility of which by certain nerves is certainly not improbable (special mechanical theory of heat); and, further, that in highly rarefied bodies they usually describe nearly rectilinear paths (kinetic theory of gases). The construct by which we represent mechanical phenomena would only be made more complicated, if not self-contradictory, by abandonment of these conclusions. The additional assumption that the molecular motions do not cease whilst the induced visible motions are transformed gradually into molecular motions, also conforms perfectly to established mechanical laws.

All the consequences of the special mechanical theory of heat, howsoever disparate be the domains to which they pertain, have been confirmed by experience; indeed, I may say that they have been attuned in their minutest details to the rhythmical pulsations of nature.[1]

[1] Of many instances I will mention but the explanation of the three states of aggregation and their transitions from one to another; further, the agreement of the concept of entropy with the mathematical expression of the probability or disorder of a motion. The assertion that a moving system of very many minute bodies

Fourier's assumptions with regard to the conduction of heat are of course of so extremely simple a nature, and the facts calculable from them conformed so perfectly to verified observations, that the assertion of his assumption and equations not being absolutely trustworthy, as first approximations, appears rather of the nature of casuistry. But I do not find it at all strange that the requirements of the situation should be satisfied by such extremely simple and plausible assumptions, for the province is very arbitrarily limited; or that subsequently facts greatly different from the kind already verified should be derivable from them.

If there should ever be forthcoming so comprehensive a theory as the present atomism, one likewise which reposed on so distinct and unassailable a foundation as Fourier's theory of the conduction of heat, then indeed this were an ideal. Whether this result is to be attained by the subsequent combination of the previously unsimplified phenomenologic equations, or whether it is to be realised by the eventual asymptotic approach of current atomic conceptions to the plane of evidence of Fourier's theory by continual adaptation and constant confirmation by experience,—this appears to me to be as yet entirely undetermined.[1] For, though the existing ob-

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tends, apart from unobservably few exceptions, towards a condition for which an assignable mathematical expression measuring the probability of the state is a maximum, appears to me to be superior, after all, to the almost tautological assertion that the system tends towards the most stable condition. As for the rest, Mach is correct in his conjecture (*loc. cit.*, p. 381) that at the time I composed a popular lecture on this topic I was unacquainted with the works cited by him as treating of the tendency toward stability, all of which but one were published years after my lecture, and all of them after the original papers of which my lecture was but a popular presentation.

If the principle of energy were the only support of the special mechanical theory of heat, and the explanation of that principle its only purpose, then the theory would be superfluous after the principle had been fully explained. We saw, however, that there are many other reasons speaking in favor of it, and that it furnishes a constructive representation of many other phenomena.

The theory of the electric fluids was from the outset artificial after an entirely different manner, and had been recognised by many inquirers from the start as provisional.

[1] Considerable remoulding and adapting (cf. Mach, *loc. cit.*, p. 380) are still to be done in the case of both theories. Fourier's equations for the conduction of heat

$$\frac{du}{dt} = k \Delta u$$

servations going to show that molecular motions in liquids and gases may be observed directly, be not regarded as conclusive, yet the possibility of future conclusive observations cannot be gainsaid. It accordingly seems to me utterly beside the mark to assert positively that such constructive representations of nature as the special mechanical theory of heat or the atomic theory of chemism and crystallisation shall ever vanish perforce from science. The sole question that can be raised is whether the precipitate zeal exhibited in the cultivation of such constructs, or the excessive caution that recommends total abstinence from them, be of greater disadvantage to science.

The extent to which physics, chemistry, and crystallography have profited from atomism in point of palpableness and perspicuity, is well known; that it has also been a clog, and hence in many cases has appeared as superfluous ballast, especially at the time when it far less perfectly conformed to phenomena than at present, and was more impregnated with metaphysical considerations, shall not be denied. Synoptic control will not be lost, nor certitude in the least impaired, if we rigorously sunder the phenomenology of the results that have been established with the greatest possible certainty from the atomic hypotheses that serve the purposes of unification, and continue to cultivate each with equal zeal, as alike indispensable. But we should not lay exclusive emphasis on the advantages of phenomenology and assert that this latter doctrine is one day to supplant the atomism now current.

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is, if k be constant, unquestionably wrong. That with k variable it should necessarily take the form

$$h\frac{du}{dt}=\frac{d}{dx}\left(k\frac{du}{dx}\right)+\frac{d}{dy}\left(k\frac{du}{dy}\right)+\frac{d}{dz}\left(k\frac{du}{dz}\right)$$

has hardly been sufficiently confirmed by experience. And it does not represent at all the effect on the distribution of heat of the compressions and dilatations inseparably incident to non-stationary conduction, or the direct action of the heated volume-elements on other more remote elements in a diathermanous body by thermal radiation (and who knows but all bodies are diathermanous for certain rays transmitting energy and necessarily therefore also heat). If it be said these phenomena are not part of the process of pure thermal conduction, it may be replied that a pure process of this character is then nothing but a metaphysical hypostatised concept.

Even though the possibility exist of combining the constructs of phenomenology into a comprehensive theory differently from the manner pursued by atomism, still the following points must be admitted:

(1) This theory can never be a mere inventory, in the sense of having a definite symbol attached to each individual fact: it would in such a case be as difficult to command the situation as it would be to have experience of all the facts individually and severally. Like the present atomism, therefore, it can be nothing more than a body of directions for the construction of a theory and view of the world.

(2) If we will but free ourselves from illusion regarding the meaning of a differential equation, or of any continuously extended magnitude generally, we cannot fail to see that the phenomenologic view of the world is itself necessarily an atomistic view, viz., a direction to think by certain definite laws the time-changes of an immensely large number of things arranged in a manifold of probably three dimensions. The things in question may of course be either homogeneous or heterogeneous, variable or invariable. By assuming a large finite number or the limit of a continuously increasing number, our construct could correctly represent all the phenomena.

Assuming the possibility of an all-embracing theory of the world, every feature of which has the same evidence as Fourier's theory of the conduction of heat, it is still a question whether it can be more easily reached by the phenomenologic method or through the perfection and empiric confirmation of the constructs of atomism. It would be even permissible to assume that several representations of the world were possible, all of which possessed the ideal traits.

L. BOLTZMANN.

LEIPSIC.

KANT'S SIGNIFICANCE IN THE HISTORY OF PHILOSOPHY.

PHILOSOPHY is frequently regarded as vain verbiage; and the great mass of the average productions of this branch of human endeavor would seem to justify the statement. Nevertheless, philosophy has exercised a paramount influence upon the history of mankind, for philosophy is the quintessence of man's conception of the world and the view he takes of the significance of life. While philosophical books, essays, lectures, and lessons may be intricate and long-winded, there is at the core of all the questions under discussion a public interest of a practical nature. The problems that have reference to it are, as a rule, much simpler and of a more common application than is apparent to an outsider, and all of them closely considered will be found to be of a religious nature.

KEYNOTES IN THE HISTORY OF PHILOSOPHY.

When we try to trace the erratic lines of the history of philosophy, the advance seems slow, but the results, meagre though they sometimes may be, can be summarised in brief statements. Thus the sophistic movement in Greece in contradistinction to the old naïve naturalists, Thales, Anaximander, and Anaximenes, is characterised by the maxim: *πάντων μέτρον ἄνθρωπος*, [Man is the measuse of all things], which is the simple solution of a series of intricate problems. In spite of its truth, it was misused by unscrupulous rhetoricians, who disgraced the profession of sophists and degraded the noble name of their science, called sophia, i. e., wisdom, to such an extent that the term "sophist" became an epithet of oppro-

brium. Socrates opposed the sophists, but in all theoretical points he was one of them. There was only this difference, that he insisted on the moral nature of man and thus became the noblest exponent of the sophistic principle. It indicates a new departure that he changed the name sophia to philosophia or *philosophy*, i. e., love of wisdom, which was universally accepted as more modest and better becoming to the teachers and spiritual guides of mankind. While he granted that man is the measure of all things, he pointed out the duty of investigating the nature of man, and he selected the Delphic maxim: γνῶθι σεαυτόν, "know thyself," as a motto for his life. It would lead us too far to show how Plato worked out the Socratic problem of the human soul, which led him to a recognition of the significance of forms, as expressed in his doctrine of ideas, and how Aristotle applied it to natural science. The Neo-Platonists developed Plato's mystical and supernatural tendencies and prepared thereby for the rise of a dualistic religion.

When Christianity became a dominating power in the world, philosophy disappeared for a while, being replaced by the belief in a divine revelation as the sole source of all wisdom; but in the Middle Ages philosophy was revived as scholasticism, the impulse to the movement being due to the revival of Aristotelianism, through an acquaintance with the writings of cultured Arabian sages.

In the era of scholasticism we have two authorities, Revelation and Science, the former conceived to be identical with the verdicts of the Church, the latter being a blind acceptance of a second-hand and much distorted knowledge of the philosopher's works. The Platonic problem of the eternal types of things was revived, and Nominalists and Realists contended with one another on the question of the reality of ideas. In their methods, however, these two conflicting schools were on the same level, for both were in the habit of appealing to certain formulæ. With them proof consisted in quotations either of church doctrines or of passages from Aristotle. There was no genuine science, no true philosophy, the efforts of the age consisting in vain attempts at reconciling the two conflicting authorities.

Modern philosophy is a product of the awakening spirit of sci-

ence, beginning with Descartes who proposed to introduce method into philosophy, as expressed in his *Discourse on Method.* He abolished the implicit belief in book authority. Falling back upon the facts of life, he bethought himself of the significance of Man's thinking faculty, and so, starting again from the subjective position of the sophists, he defined his solution of the basic problem with great terseness in the sentence: *Cogito ergo sum,* [I think, therefore I am].

The latest phase in philosophy begins with Kant, and it is his immortal merit to have gone to the bottom of the philosophical problem by reducing its difficulties to a system. In the Cartesian syllogism he saw a fallacy if it was interpreted to mean "*Cogito ergo ego sum.*"

The subject *ego,* implied in "*sum,*" is implicitly contained in "*cogito,*" and thus if the sentence is meant to prove the existence of a metaphysical ego, the argument is a fallacy, being merely a deduction derived from the assumption that the ego does the thinking.

Kant took the next step in seeking for the principle that determined all thinking, and discovered it in the purely formal laws of thought, which in their complete unity constitute pure reason. The investigation of the conditions of thought, he called "criticism." He insisted that all dogmatical declamations of the several systems of metaphysics were idle and useless talk. He said they were vain attempts at building a mighty tower that would reach to Heaven. But at the same time he claimed to prove that the supply of building materials was after all sufficient for a dwelling-house spacious enough for the needs of life and high enough to survey the field of experience.[1]

In place of the old metaphysics which used to derive from pure concepts a considerable amount of pretended knowledge concerning God, the world, and man, concerning substance, as the substratum of existence, the soul, the future state of things, and im-

[1] See *Critique of Pure Reason* in the chapter "Transcendental Doctrine of Method," Max Müller's translation, p. 567, Meicklejohn's, p. 431, original edition, p. 707.

mortality, Kant drew up an inventory of the possessions of Pure Reason and came to the conclusion that all knowledge of purely formal thought is in itself empty and that sense-experience in itself is blind; both combined form the warp and woof of experience, which alone can afford positive information concerning the nature of objects. Empirical knowledge of the senses furnishes the material, while formal thought supplies the method by which perceptions can be organised and systematised into knowledge. Kant's aim was not to produce glittering generalities, but to offer critique, that is to say, a method of, and norm for, scientific thought; and he said, conscious of the significance of his philosophy:

"This much is certain, that whoever has once tasted critique will be ever after disgusted with all dogmatical twaddle."

Dogmatism in metaphysics is the dragon which Kant slew. But what does that signify?

Mystic tendencies of a religious nature such as found a classical exposition in Kant's contemporary and namesake, Emanuel Swedenborg, rendered some of the problems of philosophy more complicated by laying a special stress upon the difference between matter and spirit, and discussing the possibility and probable nature of purely spiritual beings; but all philosophising on the subject consisted in declamations and unproved propositions.

Wolf, a clear-headed thinker, though void of originality, reduced the metaphysical notions from Aristotle down to the eighteenth century to an elaborate system, and thus became to Kant the typical exponent of dogmatism.

In contrast to the metaphysical school, the sensualists had risen. They are best represented by Locke who denied the existence of innate ideas (except the idea of causation) and tried to prove that all abstract thought had its origin in sensation. Hume, taking offence even at the claims of causation as a necessary connexion, declared that, accustomed to the invariable sequence of cause and effect, we mistake our subjective necessity of thinking them together for an objective necessity, which remains unproved. Thus he turned skeptic and gave by his doubts regarding the objective validity of causation as a universal principle and a meta-

physical truth the suggestion to Kant to investigate the claims of all metaphysics, of which the notion of causality is only a part.

Here Kant's philosophical reform set in, which consists in rejecting both the skepticism of Hume and the dogmatism of Wolf and in offering a new solution which he called criticism.

PERSONAL TRAITS.

Kant, the son of simple but rigorously pious parents of Scotch extraction, was born at Königsberg in Prussia under the rule of

Liebster Freund!

Ewigkeit beschäftigen Überbringer dieses Hr. Reimer mit Vorwendung an
seine Frau, meiner meinen Bekanntschaft, die mir schätzbar sein
ist, [illegible] was sich meinem ähnlichen Empfindungen empfehlen und
Fällen seine Lage, mich bey der Rückreise nach Königsberg zu bringen. Unter
allen diesen schwierigen Umständen habe ich an Ihnen allein so lange mein
Vertrauen gesetzt, und gewünscht, Sie auf meinen Todesfall hier in meinem
Alter von 68 Jahren Ihnen meine Schriften und sage Ihnen, daß die
Manuscripte zwey Theile, wovon allenfalls Exemplare sind, die älteste
5 verschiedene und zum Theil sehr verschiedene Bücher sind, ganz ist
die andere ein Ganzes ausmachende Bücher sind, ganz ist
versorgt. Ihr Kinder Ihr werdet sehr bey ihrer ausführlichen Lage
Einrichtung meinen Briefen und meiner Meinung nach einsehen, daß
die Schrift der Aufbewahrung werth sey und vor unserm gemeinschaftlichen
Leben genommen Einsicht verhindert werden. Wenn ich mir
einmal von Ihnen Zustand Ihrer eigenen Familien Nachricht geben will,
so wird es mir angenehm sein.

Übrigens bin ich Ihrer Erinnerung immer mit sehr lebhaften Vergnügen,
mit unveränderter Hochachtung

Ihr

ganz treuer
I. Kant

Königsberg
d. 26 Febr.
1792

Frederick the Great.[1] His moral sense was stern and unalloyed with sentimentality. He never married, and his relation to his relatives was regulated strictly according to his views of duty.[2] In his philosophy as well as in his private life he was duty incarnate. While he had imbibed the sense of duty that characterises the system of education in Prussia, he was also swayed by the ideals of liberty and fraternity so vigorously brought to the front by the French revolution.[3] His influence on the German nation, on science, religion, and even politics cannot be underrated, although his ideas did not reach the people directly in the form he uttered them, but only indirectly through his disciples, the preachers, teachers, and poets of the age. His main works which embody the gist of his peculiar doctrines are the *Critique of Pure Reason*, the *Critique of Practical Reason*, and the *Critique of Judgment*. Among them the *Critique of Pure Reason* is by far the most important one.[4] It is a pity that the *Critique of Pure Reason*, from the appearance of which the historian dates the beginning of the latest period in the evolution of philosophy, is a ponderous and almost unintelligible work,—a book with seven seals to the average reader; and it might have remained ineffectual had not Kant been necessitated to rectify this defect by giving to the public a popular explanation concerning his intentions.

The *Critique of Pure Reason* was published in 1781. In the

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[1] For a good condensed statement of Kant's life see Professor Windelband's *History of Philosophy*, translated by Prof. James H. Tufts of Chicago, p. 534. For a convenient chronological table of the data of Kant's life and publications see Paulsen's *Kant*, pp. 393–395 (Frommann's *Klassiker der Philosophie*, Vol. VII., Stuttgart, 1898).

[2] We here reproduce a sample of Kant's handwriting, a letter of his to his brother, which plainly characterises his business-like conception of duty which regulated his life with machine-like precision.

[3] Heinrich Heine described Kant to the French most drastically in an essay on German philosophy, a German translation of which made by the author himself is contained in Heine's *Gesammelte Werke*.

[4] A splendid analysis of the three *Critiques* is given by Prof. A. Weber in his *History of Philosophy*, translated from the fifth French edition by Prof. Frank Tilly, pp. 436–472. The compilation of Kant's philosophy in a *Kantlexicon* by Gustav Wegner (Berlin, 1893) is not very serviceable. The book is unhandy and lacks the main requisite of a lexicon, a good index.

Critik
der
reinen Vernunft

von

Immanuel Kant

Profeſſor in Königsberg.

Riga,
verlegts Johann Friedrich Hartknoch
1781.

TITLE PAGE OF *The Critique of Pure Reason* (RIGA, 1781).

Göttingenschen Gelehrten Anzeigen of January 19, 1782, there appeared a review of the book, written by Garve and modified by Feder, which irritated Kant considerably, because the review treated his criticism as a revival of Berkeley's idealism, which was commonly regarded as pure subjectivism.[1] There is no need here of protesting in Berkeley's name against this interpretation of his phi-

C. Garve.

losophy, for we are concerned here with Kant, not with Berkeley. But even Kant misunderstood Berkeley, and for our present pur-

[1] Garve's letter to Kant and Kant's answer contain the whole material of the history of this garbled review. They are interesting reading but mainly of a personal nature, consisting of explanations, excuses, and polite words. For a reproduction of this correspondence see Reclam's text edition of Kant's *Prolegomena*, Appendix, pp. 214 230.

pose it is sufficient to say that Berkeley's idealism meant to Kant and his contemporaries pure subjectivism.[1]

Kant was irritated because his philosophy was disposed of as an old error, a method which (as Paulsen says) has been developed into a regular system among a certain class of Roman Catholic critics who regard the possibilities of philosophising as exhausted in the history of philosophy. Claiming to be in possession of the whole truth, they are naturally disinclined to believe that new truths can be brought to light. Thus they have developed the habit of associating every new idea with some one of the systems of the past which to them are nothing but a *catalogus errorum*, and serve them as so many coffins in which to bury any doctrine that does not receive their approbation.[2]

Kant's indignation was perhaps exaggerated, for he ought to have considered the difficulty of understanding a doctrine that was at the same time utterly new and presented in a most unattractive, pedantical form; but the result was happy, for he felt urged to write a popular explanation of his work, to offset Garve's misconception, which would serve the reader as *Prolegomena*, i. e., as prefatory remarks to the *Critique of Pure Reason*.

These *Prolegomena* insist on the newness of Kant's proposition and emphasise his adhesion to realism (or the doctrine that the objective world is actual) in contrast to the subjectivism of Berkeley, or what was supposed to be Berkeley. At the same time they possess the charm of wonderful vigor and directness. Here Kant does not write in the pedantic, dignified style of a professor, but with the boldness of a resentful author who, conscious of his title to careful consideration and believing himself to be wrongly criticised, is anxious to be properly understood by the public.

While the *Critique of Pure Reason* is synthetic, the *Prolegomena* are (as says Kant himself) analytic. In the *Critique of Pure Reason* Kant discourses as one who speaks *ex cathedra*, sitting in

[1] For a condensed statement of Berkeley's idealism see Thos. J. McCormack's preface to Berkeley's *Treatise Concerning the Principles of Human Knowledge* Chicago, The Open Court Pub. Co., 1901, especially pp. xii–xiv.

[2] See Friedrich Paulsen's *Kant*, p. 229.

the professorial chair; he propounds his doctrine deductively, and I for one can very well understand that his expositions appear to an uninitiated reader bewilderingly oracular. In the *Prolegomena* his style is not stilted but rather careless and though his periods are long they are fluent and easily understood.

KANT'S TERMS.

The main difficulty of understanding Kant, to later generations, and also to foreigners not to the manner born as regards the German vernacular, lies in his terminology. Simple though his terms are when once understood, they afford unsurmountable difficulties to those who are not familiar with their significance.

Familiarity with the following terms is indispensable for a comprehension of Kant: "metaphysics"; "understanding" and "reason"; "empirical" and "experience"; "noumenon" and "phenomenon"; *a priori* and *a posteriori*; "transcendental" and "transcendent"; and "intuition" or *Anschauung*.

First, above all, there is the term "metaphysics," which is the science of first principles. Aristotle, who discusses the subject of ἀρχαί, or first principles, in books placed after the physical treatises (hence the name τὰ μετὰ τὰ φυσικά, *sc.* βίβλια, corrupted into metaphysics), calls it First Philosophy, i. e., the Essence or basis of Philosophy, and identifies it with Theology, because he finds in God the ultimate *raison d'être* of all metaphysical concepts such as being and becoming, space and time, multiplicity and unity, things and the world, cause and effect, substance and quality, God and soul and immortality.

Kant started a new line of investigation and kept in view his main aim. So it was natural that he did not feel the need of certain discriminations before his work was pretty well advanced. This accounts for a few inaccuracies in the use of his terminology, covering the terms "understanding," "reason," and "experience." He distinguishes in his *Prolegomena* between reason and understanding, but the discrimination is by no means thoroughly carried out. The understanding is defined as the use of the categories, and reason the faculty of forming ideas. The understanding accordingly

represents the logical functions, and reason the domain of abstractions and generalisations. The understanding draws conclusions and attends to the machinery of thinking, reason seeks oneness in plurality, aims at a systematical comprehension of things apparently different and establishes laws to explain the variety of phenomena by one common rule.

By "empirical" Kant understood all those judgments that contain sensory elements. They were either mere perceptions, i. e., a taking cognisance of sense-impressions, or experience, i. e., the product of thought and perceptions, resulting in empirical statements that are universally valid.[1]

The contrast of perceptions, as the sense-woven pictures of things, and ideas or the mind-begotten concepts of them, is expressed in the two terms "phenomenon" or appearance, and "noumenon" or thought. Kant translates the former by the word *Sinneswesen*, i. e., creature of the senses, and the latter by the word *Gedankenwesen*, i. e., creature of thought.[2]

Noumenon should not mean "thing in itself," as which it is actually used by Kant contrary to his own definition, but man's subjective conception of the thing in itself. If the phenomenon is subjective appearance, the noumenon, far from being objective, ought to be, according to Kant, still more subjective, being a mere subjective digest of the materials furnished by the subjective phenomenon.

The terms *a priori* and *a posteriori* are of special significance. They mean "before" and "afterwards," but we must bear in mind that they should be understood, not as a temporal succession, but in a logical sense. *A priori* cognitions are the principles which the naturalist uses in his investigations; but his investigations themselves, consisting of sense-experience, are *a posteriori*. Before

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[1] That Kant's use of the term "experience" was not always consistent I have endeavored to explain elsewhere. See *Primer of Philosophy*, pp. 30 ff.

[2] Pronounce *no-oomenon*, not *noomenon*. The original Greek reads *νοούμενον*. The *ou* in the German transcription, "*No-umenon*" was misinterpreted as a French *ou*; hence the erroneous pronunciation of some English lexicographers as "noomenon."

he begins his investigation, the naturalist must know that $2 \times 2 = 4$, that there can be no effect without a cause, that he can rely on the rule of three and on the syllogisms of logic. The knowledge of these truths is the condition of science, and all these truths are universal, i. e., they apply to all possible cases. *A priori* knowledge has developed through the practice of sense experience. Indeed, sense-experience came first in temporal order; but sense-impressions would forever remain a mass of isolated things were they not systematised with the assistance of *a priori* principles.

A priori does not mean innate, for neither mathematics, nor arithmetic, nor logic is innate; but the theorems of these sciences can be deduced in our thoughts without calling upon sense-experience to aid us. Innate ideas would mean inherited notions, like the instincts of animals. The characteristic feature of *a priori* conceptions is not that we know them well nor that we find them ready-made in our minds, but that they have a universal application and are therefore necessary truths.

The contrast between *a priori* and *a posteriori* truths is easily explained when we consider that the former are purely formal, the latter sensory. The former therefore cannot give us any information concerning the substance, the matter, the thingish nature of things (as Kant expresses it, "they are empty"), but they can be used for determining the relations and forms of things, and this renders them uniquely valuable, for science is nothing but a tracing of the changes of form, an application of the laws of form, a measuring, a weighing, a counting; and their paramount importance appears in this that our knowledge of the laws of form will in consideration of their universal validity, result in the possibility of predetermining future modifications under given conditions.

There are two synonyms of *a priori*, the word "pure" and the term "transcendental."

Reason unalloyed with notions derived from sense-experience, and therefore limited to conceptions *a priori*, is called pure reason. "Transcendental" means practically the same as pure and *a priori*. By transcendental discourses Kant understands those which transcend experience and consider its *a priori* conditions. Thus, tran-

scendental logic is pure logic in so far as pure logic is the condition of applied logic. Transcendental psychology is the doubtful domain of abstract notions concerning the unity of the ego, its substantiality and permanence, etc. Transcendental cosmology consists of the ideas of existence in general and the universe in particular. Then the questions arise as to the world's infinitude or limitedness, its eternity or beginning and end. Further, whether or not causality is absolute, viz., is there contingency only, or is an uncaused will possible? Here the oracle of pure reason fails and Kant formulates the result in his strange doctrine of contradictions, or as he calls it, antinomies of pure reason.

Transcendental cosmology, transcendental psychology, transcendental theology, are not sciences, but the dreams of metaphysics. As such they transcend experience to the extent of becoming hazy. They cease to be accessible to comprehension and are then in Kant's terminology called "transcendent."

Mark the difference between the two terms: the word "transcendental" denotes the subjective conditions of all experience, consisting in the recognition of such truisms as logical, arithmetical, and geometrical theorems, which are the clearest, most indisputable, and most unequivocal notions we have. Transcendent, however, means that which lies beyond the ken of all possible knowledge within the nebulous domain in which we can as well affirm as deny the possibility of assumptions. Consider at the same time that in the English language "transcendental" is a synonym of "transcendent," and the difference made by Kant has been slurred over by many of his expositors. What a heap of confusion resulted from this carelessness! We need not wonder that his radical system of transcendental criticism was transformed into that uncritical metaphysicism, or dabbling in unwarranted transcendental notions which Kant so vigorously and effectually combated.

The confusion which English interpreters produced by their neglect of distinguishing between "transcendent" and "transcendental" was increased by their misconception of the term *Anschauung*, which, being properly but not adequately translated by its

Latin equivalent "intuition," became tinged with all the mysticism and metaphysicism of intuitionalism. "Intuition," according to the commonly accepted use of the word, means in the English as well as in German "the power of the mind by which it immediately perceives the truth of things without reasoning or analysis." As such intuitions signify not only the images of sense-perception, but also, and indeed mainly, ecstatic visions in which the soul is face to face with presences spiritual, supernal, or divine; and thus it happened that under the guarantee of Kant's criticism the most extravagant speculations could gain admission to the philosophical world as genuine philosophical ideas.

Anschauung, like the Latin *intuitio*, signifies the act of *looking at* an object; it denotes the sensation of sight. However, its use is not restricted to sight, but extends to all sense-perception. The peculiar feature of sense-perception consists in its directness and immediate appearance in our organs of sense as sensation. When we look at a tree we do not argue; we simply see the tree. We need not know anything about the physical processes that take place both outside in the domain of ether-waves which are reflected on the sighted object, and within our eye where the lens produces an image that is thrown upon the surface of the retina, in the same way in which the photographers's camera produces a picture on the sensitive plate. The picture seen is the result of the process, and all epistemological considerations are afterthoughts. The same is true of all sensations. Sensations, though the result of complicated processes, are given facts; they are the data of experience and there is no argument in them, no reasoning, no deliberation, no hesitation, as to their truth; they are the realities of life, and from them we construct our notions of the world in which we live.

It is a pity that we have not a Saxon equivalent for the German *Anschauung*. We might coin the word "atsight," which (in contrast to insight) would denote the act of perceiving a sighted object; but the word, in order to make the same impression, ought to be current, which the term atsight is not. The translation "intuition" is admissible only on the condition that we exclude from it all mystical notions of subjective visions and define it as visual-

ised perception. There are passages where *Anschauung* is an exact synonym for "sense-experience" or "perception," and we might translate it thus were it not for the extended use Kant makes of the term by speaking of *reine Anschauung*, meaning thereby the pure forms of sense-experience which are as much immediate data of perception as are the sense-elements of sensation.

If we had to recast the exposition of Kant's philosophy we could avoid the term "pure intuition" and replace it by the pure forms of sense-experience, but if we would render Kant in his own words we cannot do so. The translator must reproduce Kant in his own language, and thus must either invent a new word such as *atsight*, or must cling to the traditional term *intuition*.[1]

KANT'S IDEALISM.

The contrasts in Kant's terminology, *a priori* and *a posteriori*, formal and material, pure reason and experience, etc., do not yet imply the conclusion at which he arrives, the main result being the ideality of space and time and of all pure forms of thought. Kant was led to it by a strange fallacy, the error of which we intend to trace in the present article.

First let us try to understand the point of view which Kant took.

The pure form of our sense-perception is the relational in the domain of sensory elements, viz., their juxtaposition, or space, and their succession, or time, their shape, their causal intercatenation, etc.

In his discourse on the pure forms of sense-perception (called "Transcendental Æsthetics"), Kant points out first of space, then of time, that they are notions which are:

1. Insuppressible (viz., we can think or assume in thought the non-existence of all objects, but not of space or time).

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[1] Mr. Kroeger's proposition, made in the *Journal of Speculative Philosophy*, II., p. 191, to translate *Anschauung* by *contemplation* seems inadmissible. Compare for further details of the use of the word the author's pamphlet *Kant and Spencer*, pp. 76 ff. In our forthcoming translation of Kant's *Prolegomena* we have rendered it a few times by *visualisation*, but mostly by *intuition*, and have (wherever it is not translated by "intuition") always added in parenthesis the German original.

2. Necessary *a priori* (viz., they are of universal application and transcendental, i. e., the condition of all sense-perceptions.)

3. Unique (viz., there is but one space and one time; all spaces, so called, are parts only of, or rooms in, that one space; and different times are periods of that one time).

4. Infinite (viz., all concrete objects are finite; but time and space, not being concrete entities, are limitless).

He concludes that space and time are not properties of objects as things-in-themselves, but the forms of their phenomenal existence.

It is obviously a mistake to regard space and time as concrete objects. Infinite objects would be monster-existences the reality of which cannot but pass our comprehension. They are the forms of things, indispensable not only for their existence in general but also for determining their several individual and characteristic types; for that which constitutes the difference of things, so far as science has been able to penetrate into the mysteries of being, is always due to a difference of form. Kant guardedly grants empirical reality to space and time; he ascribes space and time to things as phenomena, and denies only their being properties of things as things-in-themselves. But he adds the explicit statement that space as well as time are "the *subjective* conditions of the sensibility under which alone external intuition (*Anschauung*, i. e., sense-perception) becomes possible." Thus, Kant concludes space and time are *a priori* intuitions; they do not belong to the external domain of reality or objectivity, but to the sphere of subjectivity; and being forms of the sensibility of the intuitive mind they are (says Kant) ideal.

Kant does not deny the reality of things, but having established the ideality of space and time he believes that,

"If we regarded space and time as properties which must be found in objects as things-in-themselves, as *sine quibus non* of the possibility of their existence, and reflect on the absurdities in which we then find ourselves involved, inasmuch as we are compelled to admit the existence of two infinite things, which are nevertheless not substances, nor anything really inhering in substances, nay, to admit that they are the necessary conditions of the existence of all things, and moreover, that they must continue to exist, although all existing things were annihilated —we

cannot blame the good Berkeley for degrading bodies to mere illusory appearances. Nay, even our own existence, which would in this case depend upon the self-existent reality of such a mere nonentity as time, would necessarily be changed with it into mere appearance—an absurdity which no one has as yet been guilty of."[1]

Thus, Kant believes that if space and time were objective they would impart their ideality to the objective world and change it to mere appearance; by conceiving space and time (and in addition to the forms of our sensibility also the forms of our thinking) as purely ideal, viz., as subjective properties of the mind, he assures us that the world, our own existence included, will be saved from the general collapse which it otherwise in his opinion must suffer.

KANT AND SWEDENBORG.

The development of Kant's theory of the ideality of space and time coincides with his investigation of Swedenborg's philosophy, if that word be applicable to a world-conception which afterwards was denominated by Kant himself as "dreams of a visionary." Swedenborgians claim that Kant was influenced by Swedenborg in the formulation of his critical idealism; and Mr. Albert J. Edmunds discusses the subject in an article which appeared in the *New Church Review*, Vol. IV., No. 2, under the title: *Time and Space: Hints Given by Swedenborg to Kant*. While it appears that there is less borrowing on the part of Kant than can be made out by Swedenborg's adherents, there is more justice in the claim of Swedenborg's influence over Kant than seems to be palatable to such Kant scholars as is Professor Vaihinger. Frank Sewall, the editor of the *New Church Review*, goes over the field in an article entitled: *Kant and Swedenborg on Cognition*, in which he makes out a good case scarcely less favorable for Swedenborg than does Edmunds. The fact is that the mystical ideas on space and time which permeate religious thought had their effect on Swedenborg as much as on other thinkers, mystics as well as philosophers, and among the latter, on Kant; and certain formulations of the problem which can be found in Swedenborg, did not strike Kant as much as may appear by a mere comparison of the passages.

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[1] *Critique of Pure Reason.* Supplement VI. of 2nd edition.

Mr. Edmunds quotes the following passages from Leibnitz, on space and time:

"Since space in itself is an ideal thing like time, it must necessarily follow that space outside the world is imaginary, as even the schoolmen have acknowledged it to be. The same is the case with empty space in the world—which I still believe to be imaginary, for the reasons which I have set forth." (V. 33.)

"There is no space at all where there is no matter." (V. 62.)

"Space . . . is something ideal." (V. 104.)

"The immensity of God is independent of space, as the eternity of God is independent of time." (V. 106.)

"Had there been no creatures, space and time would only have existed in the ideas of God." (Paper IV. 41.)

Here Leibnitz uses the very word "ideal," of both space and time. Incidentally we must add that naturalists of to-day will no longer countenance Leibnitz's view of the non-existence of empty space.

There is even the religious mysticism displayed by Leibnitz which makes God independent of space and time. Swedenborg says the same about the angels:

"The angels have no idea of time. Such is the case in the world of spirits, and still more perfectly in heaven: how much more before the Lord. (*Arcana Cœlestia*, 1274.)"

It is a fact that Kant had read Swedenborg, but the coincidences as to the ideality of space and time and the theory of cognition are trivial as compared with the coincidences with former philosophers, such as Leibnitz. The truth is, we have in Swedenborg the type of a religious thinker who formulates his conception of space and time and other metaphysical doctrines in the shape of mystical allegories, after the fashion of Jacob Boehme and other religious visionaries. It is wrong on the one side to overestimate his mystical expressions, which are commonplace among authors of his ilk, and, on the other hand, to ridicule them as purely visionary, devoid of philosophical value. It is characteristic of the human mind at a certain stage of its development to formulate in mystical language philosophical conceptions which lie beyond the grasp of the intellect of that peculiar stage of growth. It is the religious

attitude of approaching philosophical problems in mystical expressions. While it is natural for a scientist to ridicule the mystic for claiming to have solved the world-problem though producing nothing but air-bubbles, it is at the same time a one-sidedness to see in mysticism nothing but wild and worthless hallucinations. Mysticism is a solution of the world-problem by sentiment, and it affords the great advantage of determining and establishing the moral attitude of its devotees. Considered as science it is absolutely worthless, considered as a guide in life its worth is determined by the spirit of which it is born. Where the religious sentiment is serious, deep, and noble, mysticism will find a poetical expression full of significance, depth, and aspiration. Kant as a religious man was attracted by Swedenborg, but when he weighed his revelations as philosophy he was so disappointed that he felt ashamed of having been caught among the credulous investigators of occult phenomena.

Swedenborg is one of the most representative mystics, and while his books may be worthless as philosophical treatises, they are not only interesting to the scientist because typical of a certain phase in the religious development of human nature, but also classical as mystical literature. The appreciation which he has found among a number of adherents proves too well how deeply his way of presenting metaphysical problems in the shape of allegorical dreams is founded in the peculiar constitution of man's spiritual system. Those who took the trouble to investigate his miracles and prophecies found that, however much might be surmised, nothing could be definitely proved, except the fact that there are people of fair and sometimes even extraordinary intelligence who have a decided inclination to believe in occult phenomena, that they, though subjectively honest, can easily become convinced of things which they are anxious to believe, and finally that in minds where a vivid imagination checks the development of critical acumen, the poetical conceptions of religious faith grow so definite and concrete as to become indistinguishable from actual life and reality.

Now, what are the lessons of the relation of mysticism to science?

We ought to consider that certain metaphysical truths (as to the nature of space, time, our mode of cognition, causation, infinity, eternity, etc.), when stated in abstract formulas, seem dry and unmeaning to unscientific minds, yet they possess a deep religious significance which finds allegorical expression in the various religious systems in myths, ceremonial institutions, and dogmas. By sensual natures who cling to the allegorical feature of the allegory, they can be appreciated only if they are expressed in a sensual way, if spiritual truths are told in parables of concrete instances as if they were material facts of the material world. It is characteristic of mystical minds to live in an atmosphere of sensual symbolism in such a way that they believe their own dreams, and their assurance makes their statement so convincing that they easily find followers among those who are kin to them in their mental constitution. As soon as a critical reader tries to verify the statements of such men, he finds himself irritated by a heap of worthless evidence, and the result is an indignation such as Kant showed after his perusal of Swedenborg's *Arcana*.

The following summarised statement of Swedenborg's world-conception is given by Kant in his *Essay on Swedenborg*, which appeared in 1766:[1]

"Each human soul has in this life its place in the spirit-world, and belongs to a certain society, which in every case is in harmony with its internal condition of truth and good, that is, of understanding and will. But the location of spirits among themselves has nothing in common with space in the material world. The soul of one man, therefore, in India can be next-door neighbor to that of another in Europe, so far as spiritual position is concerned; while those who, as to the body, live in one house, may be quite far enough distant from one another as to those [that is, spiritual] conditions. When man dies his soul does not change its place, but only perceives itself in the same wherein, with regard to other spirits, it already was in this life. Besides, although the mutual relation of spirits is not in real space, yet it has to them the appearance of space, and their relations are represented, with their accompanying conditions, as nearnesses; their differences as distances, even as the spirits themselves have not really extension, yet present to one another the appearance of a human form. In this imaginary space there is a

[1] We quote from Mr. Albert J. Edmunds' essay in the *New Church Review*, p. 261.

plenary community of spiritual natures. Swedenborg speaks with departed souls whenever he pleases, etc."

Now, if we comprehend that besides the causal connexion of things in space and time there is a logical interrelation which appertains to pure reason, we shall come to the conclusion that Swedenborg's ideas are quite legitimate, if they are but understood to be poetical and if we are permitted to conceive them in a strictly scientific sense. We read:

"The soul of one man in India can be next-door neighbor to that of another in Europe so far as spiritual position is concerned; while those who as to the body live in one house may be quite far enough distant from one another as to those (that is, spiritual) conditions."

Now, it is obvious that this sympathy of souls, which is not according to space and time, but according to spiritual kinship, is quite legitimate and very important to those who understand it. The sensual man will find difficulty in grasping its significance, except that it be stated to him in a sensual way. Obviously, it is true that "spirits themselves have not really extension." Their interrelation is of a different kind. But if we imagine them, as Swedenborg does, "to present to one another the appearance of a human form," we conceive of their existence as though it were in space, another kind of space than that filled by matter, and "in this imaginary space there is a plenary community of spiritual natures." Thus logicians represent the interrelation between genus and species by geometrical figure, the one including the other.

Swedenborg is simply a man whose imagination is so vivid and whose scientific criticism is so little developed that the imaginary space invented to represent the interrelations of spiritual realities which are in neither space nor time, becomes an actual space to him; his spirits become materialised shapes, and thus it happens that he can speak "with departed souls whenever he pleases." A scientist too, a historian or a naturalist, can consult the wisdom of the departed spirits. He can make himself acquainted with the views of Newton, of Goethe, of Kant; he can incorporate their souls in his own being, but being of a critical nature, he will not see them as bodily shapes. It is characteristic of mystics that their

imagination outruns their sobriety, and thus the flights of their fancy become real to them.

While it is not impossible that Swedenborg became the fulcrum on which Kant elaborated his metaphysics, we may at the same time justify the opposite statement that Kant's relation to Swedenborg is purely incidental and without significance. The elaboration of his theories as to space and time and cognition, Kant made at the time when he read Swedenborg's works, but we must be aware of the fact that Kant was familiar with mystic views in general, and Swedenborg's expressions did not strike him as much as it might appear to those who compare Swedenborg and Kant only, but have no reference to Leibnitz and other thinkers. Certainly, Kant would have come to the same conclusion if he had dealt with any other thinker of a similar type, Jacob Boehme, or even spirits on a lower level in the line of mysticism.

While Kant's statements show a certain resemblance to those of Swedenborg, we find that their agreement with Leibnitz (a philosopher whom both Immanuels, the great mystic as well as the great critic, had studied carefully) is much closer. We shall at the same time understand why Kant exhibited a decided contempt and scorn for the dreamy haziness of these visionaries, which, when dealing with scientific problems, is sterile and unprofitable. In contrasting the philosophical study of metaphysics with those vague fancies of religio-philosophical dreams, Kant compared the latter to the intangible shade of a departed spirit, quoting Virgil's well-known verses where Æneas in the under-world tries to embrace the soul of his departed father, Anchises.[1] Kant says:

"Metaphysics, with whom it is my destiny to be in love, offers two advantages, although I have but seldom been favored by her: the first is, to solve the problems which the investigating mind raises when it is on the track of the more hidden properties of things through reason. But here the result very frequently deceives hope, and has also in this case escaped our longing hands.

"Ter frustra comprensa manus effugit imago,
Par levibus ventis volucrique simillima somno."—(VIRGIL.)

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[1] Æneas, Book VI., Verses 701–702.

[Thrice I tried to embrace and thrice it escaped me, the image,
Airy and light as the wind, and to volatile dreams to be likened.]

KANT'S ANTINOMIES.

After this digression we revert to Kant's idealism and will now point out the result to which it leads.

Kant, as we have seen, protests against being an idealist in the sense that the reality of the external world of objects or things be denied. His idealism insists only on the ideality of space and time; and by ideality he understands subjectivity. But together with time and space all our forms of thought are assumed to be purely ideal. Hence there is a rift rending asunder form and substance, thought and reality, representative image or phenomenon and the represented objects. We know phenomena, not noumena. Things in themselves are unknowable, for the laws of pure form have reference to appearances only.

If purely formal thought has no objective value, it can be used merely to decide problems that lie within the range of experience —the domain of appearance; but things in themselves, the domain of transcendent existence, lies without the pale of any possible knowledge.

Kant's method of dealing with these subjects is peculiar. He neither leaves them alone nor solves them, but formulates the affirmations as well as the negations of a series of contradictory statements in what he calls "the antinomies." Here the weakness of Kant's philosophy comes out, indicating that there must be a flaw in it somewhere.

It is interesting to notice that as to Kant's Antinomies of Pure Reason the great Kōnigsberg philosopher has been anticipated by Buddhism in which (according to Neumann's *Reden Gautamo's*, Vol. II., No. 60) the antinomies are taught in a similar, partly literally in the same, form. But there, too, the contradiction belongs to the formulation of the statement of facts, not to the facts themselves.

In a certain sense we can say, the world must have had a beginning, and must come to an end; and the world had no begin-

ning and can have no end. If we speak of this definite nebular system of stars comprising the entire milky way we are compelled to admit that it began and will at some definite though distant future be dissolved again; but if we mean by world the totality of existence in all its shapes, prior forms and causes of origin, we must own that it has existed and ever will exist. We could go back in thought to the time before the present cosmos started, when other worlds were evolving or dissolving and a different kind of universe or condition of things prevailed and so on without coming to an end. But these conditions being the causes of the present world are included in our concept of the universe. The antinomies are due to the equivocal significance of our words, not to a fault of reason; nor do they indicate that existence itself is self-contradictory. The contradiction is not in the things but in our conception of things.[1]

Schopenhauer has vigorously attacked Kant on account of his antinomies, insinuating weakness and hypocrisy. But it seems to us, while by no means agreeing with Kant on this particular point, that granting his premises his conclusion was justified. The four points of the antinomies, viz., the eternity and infinite divisibility of the world, the contrast of freedom to causation and the existence of God, are no longer of a purely formal nature; some notions of experience are inevitably mixed up in them, and thus pure reason is unable to decide either way. We might as well try to determine by *a priori* considerations as to whether or not electricity can be produced by friction, or whether or not by rubbing an old metal

[1] That the antinomies cannot be regarded as true antinomies or contradictions of reason, but as the result of a misconception and lack of clearness in our formulation of the several problems, becomes apparent in the antinomy of freedom *versus* necessity. Kant's definition of freedom (§ 53) as a faculty of starting a chain of events spontaneously without antecedent causes and his way of reconciling freedom and nature (or as we would say "determinism") is subject to serious criticism. Compare the author's solution of the problem in *Fundamental Problems*, pp. 191–196; *Ethical Problems*, pp. 45–50, 152–156; *Primer of Philosophy*, pp. 159–164; *Soul of Man*, pp. 389–397. See also *The Monist*, Vol. III., pp. 611 ff., "The Future in Mental Causation." Concerning the *ought* and its assumed mysterious nature compare the chapters "The *Is* and the *Ought*," and "An Analysis of the Moral *Ought*," in *The Ethical Problem*, pp. 279–295.

lamp the genii of the lamp will appear. Hence, before the tribunal of pure reason either side, the affirmative as well as the negative, is defensible, and thus we should be obliged to settle the question with other methods; other methods, however, according to Kant's notions concerning the nature of metaphysical questions, would not be admissible, because he insists that all metaphysical notions must be derived from pure concepts alone.[1]

EDITOR.

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[1] A critical examination of Kant's philosophy we reserve for the second part of our discussion which will appear in the next number of *The Monist* under the title "Kant's Philosophy Critically Examined."

LITERARY CORRESPONDENCE.

FRANCE.

M. G. E. ALAUX, one of our most distinguished philosophers, whose zeal and convictions age has not weakened, has undertaken to sum up in a little volume entitled *Dieu et le monde, Essai de philosophie première* his views on metaphysics, which have taken here a very precise and distinct form. In some respects his doctrine would seem to be an expression of the Christian faith, or more precisely the reasoned justification of the fundamental dogma of the Trinity. It is evident, however, that he offers us things new and important, both as to methods of reasoning and as to doctrines and theories proper, touching, for example, the problems of liberty, of evil, and especially of moral sanction, which finds its individual guarantee in the succession of existences.

The work of M. Alaux is concerned with the critique of the contradictory ideas of our reason: the affirmations arise here in some sort from the interplay of contraries. It would be impossible for me to present even a fragment of his doctrine without running the risk of disfiguring it. The devotees of metaphysics will find here much to interest them; while as for myself, I am far from being indifferent to these efforts of the human mind, which is always bent on surmounting the difficulties which it has encountered time out of mind. I can nevertheless not refrain from making one general criticism: my objection is that, penetrating as our dialectic may be, it always leaves it for us to say what our concepts really represent,—what the symbols which enter our system represent. The change of our states of consciousness is the condition of feeling;

the opposition of terms is the condition of logic. But what can be deduced from this two-fold necessity?

I see no way, I wrote recently, of resolving or eliminating these antinomies, which are always present,—the antinomies of the absolute and the relative, of the infinite and the finite, of the one and the many, etc., or in another sphere, pleasure and pain, good and evil, etc.,—save by considering them as simple attitudes of our mind. They correspond to our manner of understanding and feeling; they are the forms of our affective and of our mental life, the states by which we become conscious of our relations with the exterior world. Is it not creating factitious contradictions to relegate outside ourselves these conditions of knowledge and sensibility? I admit, of course, that we cannot either efface from things the mark of our own mind, or subject to doubt the necessary conformity of our organisation with the regular order of things,—a conformity of the reality of which we have the soundest assurance. But it is right here that the true problem lies, and we should be on our guard lest we deceive ourselves regarding the value of the logical artifices by means of which we explain the universe.

M. Alaux will pardon me for the exceptions that I here take; they do not prevent me from holding his work in high esteem, and they are certainly not designed to erect any obstacles to research on the great highways of metaphysical research.

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M. E. Murisier, in *Les maladies du sentiment religieux*, offers us a study which has both novelty and interest. With a view to reaching a more precise definition of religious sentiment, he proposes to analyse the pathological forms of this sentiment. One of these forms is ecstasy; the other is fanaticism. Ecstasy, the last stage of the mystical tendency, corresponds to a self-introversion of the individual who wishes to enter into direct communication with his God; while, contrariwise, fanaticism means an expansion beyond, with the object of imposing upon others the faith which one has in one's heart. In both cases we have to do with diseased persons who are suffering from organic, affective, and intellectual maladies, and incapable of all and every synthetic effort to adapt

themselves to their environment. They seek relief for their conditions of non-accommodation in contradictory ways: the former annihilate their own tendencies, which they are unsuccessful in coordinating; the latter endeavor to shape the social environment to conform to their personal standard. The ecstatic subject reveals two essential characteristics of normal piety: (1) the need of direction; (2) the imitation of a model. This subjective state, this longing for renunciation in ecstatics, gives us the true meaning of the *Imitation of Jesus Christ*. It informs us concerning the eternal tendencies to which religion answers.

Fanaticism instructs us rather regarding its social rôle. A supernatural power guarantees for the religious man the regularity and permanence of his environment, which naturally changes; it is the tranquillity and happiness of the feeble being which finds itself assured in its old adaptations, and altogether free from the necessity of new adaptations.

Religion, in fine, maintains the social unity and stability: absolute in fanaticism, this unity and this stability remain relative in the normal religious forms. Thus, religion is not expressly either an interior life, as the theorists of individualism would have it, nor a pure manifestation of the collective consciousness, as the sociological school believe. The individual form, M. Murisier thinks, is not derived from the collective form: the internal tendencies to unification rather determine and support the tendency toward social unification, which serves them most actively.

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By the side of the two works last mentioned a place is deserving for the brief and excellent little book of M. HENRI BERR, *Peut on refaire l'unité morale de la France?*[1] Although this work treats especially of France, its interest is nevertheless more far-reaching inasmuch as the condition of minds in every country is almost the same; I refer to the conflict, whether apparent or real, between science and faith. The special feature about France is the peculiar course which the combatants have adopted, together with a pecu-

[1] A. Colin, publisher. The other works are published by F. Alcan.

liar combination of circumstances resulting from a different historical evolution.

M. Berr defines religious faith as "a conception of things which, imposing itself on the mind, is transformed into principles of action, regulates the relations existing between men and between men and the universe." "Faith," he writes again, "is the affirmation more or less conscious of the unity of the being affirming it, the theoretical provisional explanation of that unity, and in conduct the application of that theory."

Can the explanation of Being be rendered more conformable to truth,—can theology be replaced by scientific philosophy? This is tantamount to asking whether or not progress is taking place in human thought. M. Berr does not hesitate to answer in the affirmative. Progress consists, according to him, in overturning the obstacles which separate the subject from the object, in unifying them: and this is monism,—a monism which is neither materialistic nor spiritualistic. The identity of subject and object as an hypothesis is in his eyes a conquest forever; the unity of essence is a permissible conjecture.

Another point gained is that science alone is the organum, the instrument for the resolution of philosophical problems. But how can science lead us to the assimilation of the ego and the non-ego? Here we find again in a condensed form the doctrine set forth some time ago by M. Berr in his work *L'avenir de la science*, to revert to which would in this place take up too much of our time. I shall merely recall that science, according to M. Berr, is the spontaneous application of the ego to the non-ego: our point of support for understanding Being is the ego; in the ego the reality resides, one and unifying. Psychology offers us the type and the means of the union sought. Science finally as synthesis has all the characters of religious faith. It cannot extinguish faith; it tacitly implies and justifies it. It is revelation,—the revelation of the truth; it is faith, belief in the possibility of knowing the truth. Humanity, in sum, has lived upon an hypothesis which has been liberated and proved by science and which is therefore in science as much as it is in religion.

M. E. FOURNIÈRE, in his *Essai sur l'individualisme*, submits to exact scrutiny the established opposition between individualism and socialism, an opposition which he denies exists. In order to resolve this opposition, he shows first that the individual is the result of the social co-operation, which will not be contested, though it also must not be denied that the individual is still the indispensable prime agent. He believes himself justified in concluding, thereupon, that socialism, "co-operation extended to all individuals," is the realisation of individualism. He defines it as a state of things where the state becomes the means of general voluntary co-operation, the regulator of combination, the agent of transformation of monopolies for the benefit of the whole.

But how is the state to be this means? By the hand of whom, by the authority of whom? How can socialism, thus defined, be really a medium to liberty? How can co-operation extended to all be voluntary at the same time? To whom shall this universal co-operation extend? What shall it embrace? What reservations shall it make? These are questions that must be taken up successively, for some laws are not true save within certain limits.

Undoubtedly, M. Fournière has made a skilful plea, full of strength and ardor, and supported by arguments of which the apparent precision does not always hide the subtle and delusive character. The author often yields to immediate preoccupation, the echo of recent struggles in our assemblies. If he is a politician who seeks justly to lift himself to the plane of his theory, he is also a theorist who is disturbed by politics. He gives way to that tendency of the revolutionary spirit which would suppress by violence realities which are unpleasant, which disdains partial solutions, the only ones which are efficacious and durable, and is bent upon accomplishing by a fiat the simultaneous variation of all social phenomena. M. Fournière has too much intelligence not to see certain things which he does not say. He would gain much in force by saying them.

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One may consult with profit the book of M. G. PALANTE, *Précis de sociologie*. Essays of this kind are apt to render good service

in the present state of this science, a state of such incoherence that the sociologists cannot even come to an agreement regarding the definition of the social datum or the thing which is the true subject-matter of psychology; and consequently regarding the method which is best suited to their researches. M. Palante sides with the psychological school. I have indicated several times the reasons which separate me from this school, but I am always curious to learn of new arguments to be advanced in its favor, my only solicitude being to see more clearly into these difficult questions. M. Palante does not convince me, and it does not seem to me that his study will dissipate the misunderstandings which divide writers in this field. The majority, I believe, persist in understanding by sociology something different from psychology, or even from "inter-psychology," to use the latest expression of M. Tarde. The psychological processes are one thing, the sociological products are another; and results realised in time—economical, juridical, political, religious, and other institutions—are with respect to their causes (the psychological agents) specific facts of existence which deserve special study. The history of property, for example, shows us facts which have their significance independent of the particular and personal situations that encompass them.

How are societies formed? How preserved? How do they develop? How do they disintegrate and die?—such, after the introduction, are the four divisions of this volume. Under these titles, the author examines the different factors or laws which have been advanced,—factors and laws relating to race, environment, population, mentality, etc. He performs his task with clearness and attractiveness.

A great admirer of Nietzsche, M. Palante is not, like the latter philosopher, inclined to theories of socialism: he declares emphatically that the inequality of individuals will never disappear, and it is sufficient to recognise this truth to remain proof against all social, pedagogical, and other systems which are based upon what I should term the sophisms of inequality.

The present volume of the *Année sociologique* (1890–1900) embraces in addition to numerous notices of books, which as usual are well classified, three original studies which take up more than 100 pages: one by M. BOUGLÉ, *Remarques sur le régime des castes*; another by M. DURKHEIM, *Deux lois de l'évolution pénale*; and a third by M. CHARMONT, *Les causes d'extinction de la propriété corporative.* I cannot even think of giving here a *résumé* of these three important memoirs, and I shall also restrict myself to mere mention of four studies which make up the contents of the *Année philosophique* for 1900; viz.: (1) an essay by M. V. BROCHARD, *Les mythes dans la philosophie de Platon*; (2) an essay by M. O. HAMELIN, *Sur une des origines de Spinozisme*; (3) an essay by M. L. DAURIAC, *Essai sur les catégories*; and (4) a paper by M. F. PILLON, *La critique de Bayle, critique du spiritualisme cartesien.*

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In the department of history I have to note from the pen of M. ELIE HALÉVY a work in two large volumes, which under the common title of *La formation du radicalisme philosophique* gives us (1) *La jeunesse de Bentham*, and (2) *L'évolution de la doctrine utilitaire de 1789 à 1815.* A third volume is to appear which shall furnish a picture of Benthamism, or "philosophical radicalism," in the final period of its development, from 1815 to 1832.

M. Halévy has endeavored to exhibit the doctrine of Bentham in its true form; that is to say, as an integral, social, juridical, economical, and constitutional doctrine, having as its foundation the principle of utility, which is itself based upon a certain psychology. First he shows us Bentham as a disciple of Helvetius, Beccaria, and Adam Smith. Then, he endeavors to ascertain how, under the pressure of general causes and the influence of James Mill, Bentham became the theorist of the radical party, and how in his own disciple, Ricardo, the theories of Malthus came to be combined with the ideas of Adam Smith.

One can imagine the interest of a study, supported by copious materials, of so important an epoch, and of a man who has had so great an influence upon the general life of the English people. For, one catches glimpses in this volume of many other features, and of

many other important events; and certainly there have been few periods in history where thought has been so active and so intimately interwoven with the public life.

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We will now go backward more than a century with M. H. JOLY and M. AD. HATZFELD, who have respectively contributed volumes on *Malebranche* and *Pascal*. M. Joly's *Malebranche* is a very readable book, as one might have expected from a writer of his ability. He has given us in his work a study of Malebranche the man and his environment, and of Malebranche the metaphysician, the philosophical theologian, the psychologist, and the moralist. He finds in the doctrine of the illustrious Oratorian a pure type of the constructive philosophy, much more so than even in that of Spinoza. He defends it against the objections which have been levelled against it, as being on the one hand too mechanical and on the other too mystical. He believes, in fine, that if Malebranche could live again in our time he would applaud the progress which our sciences have made, as well as the researches of contemporary physiological psychology; he would see in them the natural sequence of his own thoughts, and would only say that science properly so called does not dispense even now with metaphysics, and that the latter has been unable to destroy religion.

Not less interesting is the *Pascal* of M. Hatzfeld. The volume begins with a psychological biography. The discussion of Pascal's scientific labors has been confided to Lieutenant Perrier, who has every qualification to treat it properly. So attractive is the figure of Pascal, as well by his misfortunes as by his genius, that our curiosity never tires in studying him and penetrating to the depth of his thought.

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M. S. KARPPE, with his *Étude sur les origines et la nature du Zohar, précédée d'une étude sur l'histoire de la Kabbale*, carries us back to the sources of "Jewish mysticism" among the peoples of Egypt and Chaldea. I could not think of giving a complete idea of this learned and fascinating work, which contains not less than 600

pages. It will be received with all the more favor, as works dealing with the philosophy of the Orient are comparatively rare, especially in France; and since we have here a characteristic aspect of Oriental thought, which has percolated through the intellectual soil of the Occident by many different ways.

M. Karppe distinguishes between Jewish mysticism and the Cabala; he does not include in the Cabala all Jewish mysticism. He seeks to avoid confounding, in a word, genuine Jewish mysticism as it appears in its origin and in the first period of its development, with the later mysticism as it was shaped in the post-Talmudic epoch and in the Middle Ages. The Bible, he remarks, is the very opposite of a mystical book; but the Bible is not the adequate expression of the Biblical epoch, and we must also take into account the ideas which were anterior to it. Jewish mysticism, moreover, is quite different from the ordinary mysticism. It does not mean a revolt of faith against reason, but on the contrary a revenge of reason upon faith; the Jewish mind took refuge in mysticism under the constraint of a rigorous monotheism, in order to save its instinct of scientific curiosity. We thus see it extending to all objects of thought and waxing great on the most heterogeneous doctrines, Babylonian folklore, reflexions of Greek philosophy, Christian scholasticism, Arabic scholasticism, the superstitions of the Middle Ages,—yet always with the endeavor of conforming to the Bible, to which the mystics attributed an esoteric meaning. It became the vehicle of free speculation developing alongside of dogmatism and in opposition to it. "Almost invisible in Biblical times, it slumbered in the Talmudic epoch and saw the full light of day in the epoch of the gaonim; it shone with its greatest splendor from the tenth to the thirteenth centuries. But it remained always at the margin of the official doctrine which beginning with the Bible extends to the Talmud, from the Talmud to the Saadia, from the Saadia to Maimonides, from Maimonides to Mendelssohn."

As to the Cabala, of which the origin does not go back beyond Isaac the Blind, it is said to have proceeded directly from the opposition between Aristotelian and Maimonidean rationalism. The Zohar, a sort of bible of the Cabalists, a confused and composite

work, according to the theory of M. Karppe, belongs to a relatively modern epoch.

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A manuscript left by the late M. CHALLEMEL-LACOUR, former president of the Senate, has just been published under the title of *Études et réflexions d'un pessimiste.*[1] M. Challemel-Lacour, who was a philosopher as well as a statesman, has given us in these pages in humorous form his thoughts concerning life and its disillusionments. Melancholy is here sharpened with irony, and paradox gives a zest to truth. Many fine sketches and rapid portraits here pass before our eyes: Leopardi, Shakespeare, Shelley, Byron, Swift, Pascal, Chamfort, and Heinrich Heine! The volume closes with a special study of Schopenhauer, before published in a slightly different form in the *Revue de Deux-Mondes*, but not yet bereft of interest.

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M. JEAN BOURDEAU, in his *L'évolution du socialisme*, gives us a very interesting page of contemporary history,—the history of socialistic doings and ideas in France in their application to politics and legislation, to communal administration, to industry, and to farm labor. M. Bourdeau shows us how greatly socialism has changed in this century and how complex its doctrines are; his study is interesting and instructive.

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It remains to announce the publication of the *Proceedings and Papers of the Fourth International Congress of Psychology*, held at Paris in August, 1900. This publication, of which M. P. JANET, general secretary of the Congress, was the editor, forms an important volume of 800 pages, containing more than 130 communications published in full or in extracts, as well as the discussions to which they gave rise. Good indices conclude the volume and facilitate reference.

I shall finally call attention to the *Revue de psychologie clinique*

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[1] Paris: Fasquelle, publisher (Bibl. Charpentier).

et thérapeutique, edited by Drs. P. HARTENBERG and H. AIMÉ.[1] This monthly review, which has already reached its fifth year, is of moderate size but contains good and admirably chosen contributions. Its object is precise, its execution clear. It is proposed to utilise here the data furnished by science of the functions of the brain, for the purpose of treating nervous disorders of all kinds (affections of the spinal cord and psychoses properly so called excluded); in other words, to apply psychology to medicine. The interest of this enterprise for the physician, and no less for the psychologist, may be imagined.

LUCIEN ARRÉAT.

PARIS.

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[1] Paris, 64 rue de Monceau (VIII[e]).

DISCUSSIONS.

PROFESSOR GILES'S HISTORY OF CHINESE LITERATURE.

Professor Giles's *History of Chinese Literature*[1] is a seasonable contribution to the Western knowledge of China, which politically, commercially, and socially is at present the center of universal interest. The book will doubtless serve to dispel to a certain extent the popular misconceptions of those who see nothing in the Chinese nation but savages and degenerates. The book has every element in it calculated to make it popular among readers of liberal culture: the style is lucid, the subject is interesting, the translations are fluent and reproduce the sense fairly well, for it must be admitted that it is all but impossible to translate Chinese poetry into any other language without sacrificing the beauty peculiar to the Chinese,—that inimitable brevity which expresses so much in a few monosyllables.

While the book is important and the subject treated in a popular and attractive style, we regret to find fault with the author for several shortcomings which detract from the usefulness of the work. As a first attempt in English the book is welcome, but its value cannot as yet be measured by strict rules of scholarship. It is a great pity that Professor Giles is extremely one-sided, and the general public is apt to take his unwarranted statements as authoritative. I will not dwell here on the irritating tone of the author's style that is most dogmatic and positive where his statements are least reliable, but limit my criticism to the lack of system as well as the irregularity of treatment. Matters of insignificance fill several pages at the expense of things important. The book is not a history, but merely a haphazard collection from the author's Chinese scrap-books, compiled with some attempt at chronological arrangement.

Professor Giles grants that the work "would be inadequate to the requirements of a native public," but it is insufficient even "as an introduction into the great field which lies beyond." It is impossible to indulge in a minute criticism of the book, but a few remarks will serve to explain my objections.

Confucius, as rightly observed by Professor Giles, marks the beginning of Chinese literature, and it is very proper to open its history with an account of the

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[1] New York: D. Appleton & Co.

Five Classics and the Four Books, both from the Confucian and a general point of view. Next to this Taoism ranks in importance, and this is also justly recognised by Professor Giles. Indeed, these two great currents of ethico-philosophical thought run through all the veins of Chinese literature. But other currents of thought are not wanting, although they have unfortunately not attained a favorable development. Such are the school of Kuan Chung, Shang Yang, Shên Pu Hai, and Han Fei (commonly called the *Fa Chia*, i. e., the jurist school); the school of Kung Sun Lung and Yin Wên (commonly called the *Ming Chia*, i. e., logicians); the school of Sun Wu, Wu Ch'i, Wei Liao (commonly called the *Ping Chia*, i. e., the military writers); and the school of eclectics, such as Têng Hsi, Shên Tao, etc. Some of the words ascribed to these thinkers are spurious, but there are enough genuine productions to reflect the thoughts and sentiments displayed in early Chinese literature. Professor Giles should have mentioned these names in his chapter on "miscellaneous writers," as he might classify them. He disposes of them in too easy a fashion by summarily condemning them as "gross forgeries," but he is liberal enough to cite stories from the *Ping Fa* (a military work), and the *T'an Kung*, an author of doubtful significance. He refers to such apocryphal works as the *Chia Yü*, and to minor authors such as *Lü Shih Ch'un Ch'iu*, and *Mu T'ien Tzŭ Chuan*, while he omits entirely *Yen Tzŭ Ch'un Ch'iu*, *Kuei Ku Tzŭ*, *Têng Hsi Tzŭ*, etc. He may believe that some of them deserve to be left out, but he ought not to have associated Mo Ti and Yang Chu with Mencius, mentioning their doctrines only incidentally. Mo Tí and Yang Chu, the former an extreme altruist, the latter no less extreme an egoist, both very prominent since the time of Confucius, have surely a right of being ranked as original thinkers. The way in which Professor Giles mentions them gives the impression that our author knows their names only through quotations of Mencius.

Further, still speaking of the "ante-Ch'in literature," viz., the first period till the first emperor of the Ch'in dynasty ordered all the books to be burned in the year 13 B. C., Professor Giles classifies Hsün Tzu as a miscellaneous writer and Han Fei Tzu as a Taoist. Hsün Tzu, however, who like Mencius was an ardent follower of Confucius, cannot be said to have been "directly opposed to the Confucian doctrine," simply because he called human nature bad,—a subject on which Confucius proclaimed no definite opinion. Han Fei belonged to the independent "school of jurists." His comments on Lao Tzu do not justify our calling him a Taoist, Taoism being better represented by Lieh Tzu and Chuang Tzu.

In the Han literature, Professor Giles gives such a prominent position to the letter of Li Ling to Su Wu as to fill several pages with its full English translation. This is altogether unjustified. Professor Giles seems to think that there were no other literary productions of equal merit and significance during the whole Han dynasty. The episode of Li Ling is pathetic enough, but is it really worth while to sacrifice so many pages for it in a history of Chinese literature consisting only of 438 small octavo pages in large type? Why did he not fill these pages with

more instructive information as to the literary activity of the Han dynasty? Above all, he should have mentioned the works of Liu Chia, Chia Y, T'ung Chung Shu, and others.

Liu Chia was a literary guest of the first emperor of the Hans and occasionally gave lectures to the royal audience on Chinese classics. The emperor, in whom the martial spirit of his victorious conquests had not yet become extinct, turned his back upon everything literary and used to exclaim: "I have acquired my empire on horseback, and what need have I for literature?" Liu Chia, however, retorted, saying: "True, you have acquired your empire on horseback, but would it be possible also to administer it on horseback?" He then dedicated to the emperor a book called *Hsin Yü* in twelve volumes, explaining the causes of the rise and decline of the ancient empires. This is the first literary monument of the Han dynasty, which was soon followed by many others.

Chia Y was one of the ablest and most scholarly high officials under Emperor Wên. The emperor was very anxious to give him an important and responsible position which would enable him to exercise full power in matters of civil and educational reform. But rivals impugned him, finally inducing the emperor to exile him from court. Chia Y never regained the emperor's favor. He died very young, at the age of thirty-three. His writings, called the *Hsin Shu*, in ten volumes, are among the best literary specimens of the age. Professor Giles cannot make any excuse for omitting his name, while he speaks of Ch'ao Ts'o whose literary talent is not equal to Chia Y's.

T'ung Ch'ung Shu, a rather intolerant Confucian, flourished under the reign of Emperor Wu. He did a great deal for the cause of Confucianism, inducing the emperor to establish colleges, to encourage the study of orthodox classics, and to put the principles of Confucian ethics into practice. He must be counted as one of the factors of the literary activity under the Han. The *Ch'un Ch'iu Fan Lou* is the title of his writings.

If Professor Giles's work should be called a history, and not an anthology of Chinese literature, he ought to have explained, for example, the revival of literature under the Hans from the general devastation that followed the literary *coup d'état* of the First Emperor of Ch'in, and recorded the names of those who composed the galaxy of men of letters in those days. The enumeration of unimportant names and the reproduction of ill-chosen samples of their writings can never make a history.

With the downfall of the Hans there followed several short-lived dynasties, first the Three Kingdoms, then a temporary unification by the Chin dynasty, and then another state of universal anarchy in which one struggling kingdom fell after another, terminating with the ascendency of the Sui dynasty, which, however, soon again gave way to the rising power of the T'angs. These prolonged civil and political disturbances, covering the space of more than four hundred years, created chances favorable to a display of strong characters, and so it is not accidental that

in this period we find the best military and political geniuses. The literary life of China, however, suffered immensely and was at its lowest ebb. Any sustained powers of speculation and reflexion were then things unknown. True, the Buddhist scholars who came from India and their native followers were by no means swept away by the waves of worldly vicissitudes, but calmly went on translating their sacred canons and adding thereto some original treatises in the spirit of their religion. But the native pundits, either Confucians or Taoists, could not emancipate themselves from the political tendency of the time. Their sole aim in life consisted in attaining to power and applying the doctrines of their masters. Whenever they succeeded, they invariably asserted their practical optimism and spared no pains in eulogising the virtues of the reigning emperor in verse as well as in prose. But as soon as fate turned against them, or when their advice remained unheeded, they fled to the mountains or the woods, where free from worldly care and formalism they sought oblivion in drinking and consolation in the Taoistic doctrine of *laissez-faire*, delighting in the title "Yin chün tzu," i. e., sages in seclusion. This will partially explain the fact that there were in those days so many "drunkard-hermits," and among them some "drunkard-poet-hermits" of great genius. Their drink was *chiu*, i. e., rice-wine, the good qualities of which are highly appreciated and praised in song.

By the way, the *chiu*-drinking habit of the Chinese poets seems to have left a permanent effect on the rhymers of succeeding generations, for the *chiu*-drinking capacity as it seems to us has ever since been considered an almost indispensable accomplishment of Chinese poets, for poets, even if sober by nature, as a rule pretend to be drunkards. Most of the finest literary productions of this period came from the pens of these wine-bibbers. Students of Chinese literature who wish to know more about them should consult for collections of poetical and prose works, the *Wên Hsüan*, and the *Han Wei Liu Chao Y Pai San Chia Chi;* for critical works, the *Yü Tai Hsin Yung*, the *Wên Hsin Tiao Lung*, the *Shih P'in*, and the *Wên Chang Yüan Chi.*

I do not intend to follow Professor Giles further in the details of his Chinese literature, and will only add a few comments on omissions which affect the general plan of the book.

A most lamentable defect in Professor Giles's *History of Chinese Literature* is his omission of the literature of Buddhism and its influence on the Chinese mind in general. Confucians from their partisan standpoint hesitate to recognise its significance and think that Confucianism has been the sole factor in their national life and that it covers everything worth mentioning in the whole bulk of their literature. The incorrectness of this statement, however, will be apparent to every impartial observer of Chinese culture. We cannot fail to notice how deeply Buddhism with its rich vocabulary, with its dialectic subtlety, with its inexhaustible imagination, and lastly with its noble sentiments, has influenced the literature of the Middle Kingdom from the time of its introduction down to the present day. The few

pages on Fa Hsian, the author of *The Record of the Buddha Country*, Kumârajîva, a translator of Buddhist sûtras, Bodhidharma, the founder of the Ch'an sect, Hsüan Tsang, the author of the *Records of Western Kingdoms*, and some other Buddhists, by no means do justice to the literary merits of Buddhism in China.

First of all, Kumârajîva's translation of several hundred important Buddhist sûtras and shâstras must be considered a monumental work in the history of Chinese literature. Before his advent China was not deficient in Sanskrit translators both native and foreign, but it was not till Kumârajîva had finished his gigantic task that Chinese Buddhist phraseology began to be permanently settled and assimilated into the body of native literature. One can well imagine what difficulties beset the work of the translator who had to do with a language lamentably poor in religious and philosophical terms and grammatically inflexible in the highest degree. He had to coin a number of new words, and, in case this was impossible, to retain the original terms transcribed in Chinese characters. Such are, e. g., *Bodhi*, *Prajñâ*, *Buddha*, *Sangha*, *Yâma*, *Mâra*, *Deva*, etc., etc.

Buddhists from India did not import their religion only, but also their literature. They did not translate Buddhist sûtras only, but also other miscellaneous works. And the latter have also left impressions on the unsystematical Chinese mind. Shên Yüeh's *Book of Four Tones* is an example. The work is considered by Chinese scholars to be a standard authority of its kind, but its fundamental principles are nothing else than a modified application of the Sanskrit *Subdavidyâ*, the science of sounds. It is strange that Professor Giles does not attach any importance to this book, though he mentions it in a cursory way—a work which was at any rate the first attempt to formulate the Chinese phonography.

The oldest literary monument left by Buddhists is the *Hung Ming Chi* by Shih Sêng Yu of the Liang dynasty. The *Hung Ming Chi*[1] is a collection of Buddhist writings from the earliest period down to the author's own time. Confucianists as a rule do not condescend to recognise the merit of their rivals, yet the compilers of the *General Catalogue of the Four Imperial Libraries* were liberal enough to mention it on the ground that the collection is "at all events superior to those compiled by commonplace followers of Buddha," and the writings are "elegant and finished."

The most pronounced and recognisable influence of Buddhism, however, was not felt until the rise of the T'ang and the Sung dynasties. In these times Buddhism wielded its full power over every phase of Chinese life, and even most antagonistic adherents of Confucius could not but feel it. In the beginning of the T'angs, Hsüan Tsang came back from his long Indian pilgrimage, bringing with him a large number of Buddhist books in Sanskrit. Encouraged by the hearty reception that was given him by Emperor Hsüan Sung, he at once began his work of translation together with his associates, which is known to Buddhists scholars

[1] Literally, Great Enlightenment Collection.

as the "New Translation," in contradistinction to Kumârajîva's "Old Translation." The New Translation shows the traces of improvement in many points on the Old Translation; it is more faithful, more accurate, more literal, although it reads more like Sanskrit than like Chinese. This must be considered as quite a revolutionary event in Chinese style and taste. And a complete assimilation of this alien element into the Chinese literary life-blood required considerable time, which was finally accomplished when the Ch'an sect (Dhyâna School) eclipsed all other Buddhist schools in its influence and propagation during the T'ang dynasty.

The Chinese seem not to have any inclination for elaborate and systematic speculation. Such a complicated and highly abstract system as the philosophy of the Tien Tai, or the Avatamsaka, or the Dharmalaksha school of Buddhism could not take a permanent hold on the Chinese intellect. So these schools exercised only a transitory influence. It was the more practical Ch'an sect that deeply affected the imaginative chords of Chinese men of letters.

The Ch'an sect produced so many great characters throughout the reign of the T'ang and the Sung dynasties that their spiritual influence was felt all over the Middle Kingdom by the learned as well as the unlearned. Even to-day we have many great Buddhist temples in China established by its devotees, though at present Buddhism is declining. These leaders of the sect composed many peculiar literary productions, in prose as well as in verse, as the result of a perfect amalgamation of Buddhist ideas with the Chinese temper. The typical verse of the Ch'an sect is called *Ch'i* or *Ch'i Sung*, a Chinese substitute for Sanskrit *gâtha*. Its form is generally seven or five metres in four lines like the ordinary Chinese *Chüeh Chü*. It embodies religio-philosophical feelings under a poetic garb, but it is not a religious poem or hymn as popularly understood by Christians, for it does not adore nor praise nor ask benediction. It has peculiarities of its own in diction as well as in sentiment, and unless the reader himself goes through all the mystic spiritual experiences of the Mahâyâna Buddhism, he will be unable to detect in it the religious aspirations which it nevertheless contains.

Almost all eminent prose writers of the Ch'an sect left their *yü lu*, "collection of sayings," which are written in a peculiar style so distinct from any classical or profane literature that we have to classify them by themselves. The most representative works of this class are the *Lu Tsou T'an Ching* (Sermons of the Sixth Patriarch) by Hui Nêng, the sixth patriarch of the Ch'an sect, and the *Lin Chi Lu*, the writings of Lin Chi, founder of the Lin Chi school. These works belong to the earliest productions of the Ch'an literature. They form a beginning only, for prose as well as poetry reached a higher development under the Sung dynasty.

The age of the Sung dynasty is the most philosophical and at the same time the most literary period in the history of China. Before this time Confucians could not comprehend the significance of the religion and philosophy of Buddhism. They simply ridiculed it and did not condescend to study its books. This is clearly shown in the fact that Han Yü, the most learned or rather most brilliant scholar

of the T'angs, did not know anything about Buddhism when he wrote the famous *Fo Ku Piao* and the *Yüan Tao*. There was not a single Chinese scholar under the T'angs that could be called a thinker. It is a very remarkable phenomenon in the history of a nation that the Chinese mind long remained entirely under a lethargic spell after it had exhibited a flashlight-like intellectual activity in the so-called ante-Ch'in period. But after this long period of sterility of not less than one thousand years China was once more awakened with the whole intellectual vitality. What a magnificent sight from the literary as well as from the philosophical point of view we have during the reign of the Sungs! And this display of fine imagination and high intellectuality was nothing more than the effect of Buddhist thought.

Let those Confucians or prejudiced critics who doubt this statement glance over a list of eminent figures that were the shining stars of the Sung literature. Among philosophers Chou Mao-Shu, Ch'êng Y, Ch'êng Hao, Chang Tsai, Chu Hsi, and Liu Chiu-yüen; among men of letters Ou Yang-hsiu, Su Shih, Su Chê, Wang An-shih; among poets Su Tzu-mei, Mei Shêng-yü, Huang Shan-ku, Liu Fang-wang—every one of them was under the overwhelming influence of the Buddhist view of life. Some of them indeed drew almost all their poetical and philosophical inspirations from Mahâyâna doctrines. Take away the significance of Buddhism from the background of the Sung literature, and we have meaningless efforts scattered here and there in a chaotic nebula.

The Sung dynasty was an age not only for belles-lettres, but also for Buddhist literature, the crop of which was especially rich at this time.

My criticism has become almost too specific for a small work, but the notoriety and scholarship of the author seem to demand a detailed exposition of its shortcomings. There is no doubt about Professor Giles's having done a good service to sinology by presenting his opportune work to English readers, but unfortunately his *History of Chinese Literature* does not justify its title nor can it be recommended as an "introduction" for those readers who do not know anything about the civilisation of the people of the Celestial Empire. Professor Giles may be one of the best Western sinologues now living, and is certainly the first European scholar who has ventured on what he terms a "general historical survey" of Chinese literature; but he is assuming too much when he declares that his work is "the first attempt made in *any* language." It is a great pity that he does not apparently understand Japanese, an almost indispensable, or at least very desirable, accompaniment to a complete comprehension of Chinese affairs. There are in every branch of literature several works written in Japanese which should not be overlooked; and certainly some of those Japanese works on Chinese literature are superior to Professor Giles's book and would be available not only for foreigners, but also for the use of native scholars. Could he have had access to them, he would undoubtedly have produced a more satisfactory work than the one before us, and would have better benefited Western readers.

T. Suzuki.

BOOK REVIEWS.

WHAT IS CHRISTIANITY? Sixteen Lectures Delivered in the University of Berlin During the Winter Term 1899–1900. By *Adolf Harnack*. Translated into English by Thomas Bailey Saunders. New York: G. P. Putnam's Sons. 1901. Pages, 301.

In the very brief preface to the English edition of these remarkable Lectures Professor Harnack declares that "the theologians of every country only half discharge their duties if they think it enough to treat of the Gospel in the recondite language of learning and bury it in scholarly folios." As all who are acquainted with the theological literature of our time are aware, he is himself equalled by few and surpassed by none in extent and variety of erudition, in accuracy, in wide view and comprehensive grasp. His *History of Dogma*, which in the very year of its completion not only became the standard work on the subject but also displaced all others, is a monument of patient scholarship which might well have formed the labor of a lifetime. Yet this is only one of his great achievements as a scholar. But Professor Harnack is more than a scholar and a critic. He is a man of deep religious enthusiasm. He is a personality rich in moral influence. He is also an orator able to rivet the attention whether of an academic or of a popular audience. When, therefore, he announced that he would deliver a series of lectures on the essential features of the Christian religion and the developments which it has exhibited in the course of history, and that the lectures would be open to students in any faculty, he attracted a class such as has probably never been seen in Berlin since the days when Fichte made his great speeches to the German nation. Not only did students of theology, history, and literature attend, but young lawyers, doctors, surgeons, and candidates for official appointments as well. That so large and so miscellaneous an audience should have assembled to hear a series of lectures on Christianity given outside the regular programme of study and bearing no relation to any examinations, is a fact which will be fully appreciated only by those who know what the conditions of life are amongst the undergraduates in a modern university.

The theme of these lectures is simple: "What is Christianity? What was it? What has it become?" Professor Harnack declines to treat Christianity from

the point of view of the apologist or the religious philosopher; apologetics, he says, even if a discipline better developed than it is, has nothing to do with the purely historical question which he proposes to answer; nor has speculative reasoning as to the content of the several conceptions of religion. His aim is to examine Christianity as it was in its origin and as it was transformed in the march of the centuries. He tells us that we must look not only at Jesus Christ and his Gospel but also at "the reflexion and the effects which he produced in those whose leader and master he became." "The more powerful the personality which a man possesses, and the more he takes hold of the inner life of others, the less can the sum total of what he is be known only by what he himself says and does." Nor is this all. We must go further; we must trace the meaning and destiny of the Gospel as unfolded in time, in the conviction that it is not identical with the shape which it took at first but "contains something which, under differing historical forms, is of permanent validity."

To give in a brief space any adequate account of Professor Harnack's presentation of the Gospel as enunciated by Jesus Christ, both in regard to its leading features and in its relation to certain general problems of life and civilisation, and then of his masterly exposition of the destiny of the Gospel in the apostolic age, in Catholicism, Greek and Roman, and in Protestantism, is quite impossible. All that can be done here is to indicate the bare results at which he arrives. He is well aware of the general criticism that what Jesus Christ proclaimed had been proclaimed before, and he frankly admits, with Wellhausen, that the Gospel was also to be found in the prophets and even in the Jewish tradition of the time. "What, then, was there that was new?" he asks.

"The question is out of place in monotheistic religion. Ask rather: 'Had what was here proclaimed any strength and any vigor?' I answer: Take the people of Israel and search the whole history of their religion; take history generally, and where will you find any message about God and the good that was ever so pure and so full of strength—for purity and strength go together—as we hear and read of in the Gospels? As regards purity, the spring of holiness had, indeed, long been opened; but it was choked with sand and dirt, and its water was polluted. For rabbis and theologians to come afterwards and distil this water, even if they were successful, makes no difference. But now the spring burst forth afresh, and broke a new way for itself through the rubbish—through the rubbish which priests and theologians had heaped up so as to smother the true element in religion; for how often does it happen in history that theology is only the instrument by which religion is discarded! The other element was that of strength. Pharisaical teachers had proclaimed that everything was contained in the injunction to love God and one's neighbor. They spoke excellently; the words might have come out of Jesus's mouth. But what was the result of their language? That the nation, that in particular their own pupils, condemned the man who took the words seriously. All that they did was weak and, because weak, harmful. Words effect nothing; it is

the power of the personality that stands behind them. But he 'thought as one having authority and not as the Scribes.' Such was the impression of him which his disciples received. His words became to them 'the words of life,' seeds which sprang up and bore fruit. That was what was new." (Pp. 47–49.)

He sums up Jesus Christ's teaching under the three heads: the kingdom of God and its coming, God the Father and the infinite value of the human soul, and the commandment of love; and he shows how that teaching is contained in its entirety in each of the three. Nor is it difficult to conclude that in Professor Harnack's view the Fatherhood of God is the fundamental thought at the centre of Christianity, and that the "kingdom" is ultimately, as he says, "the treasure which the soul possesses in the eternal and merciful God." He deals, too, in a very striking, frank and original way with the application of this teaching to such questions as asceticism, the burden of poverty and distress, public order and civilisation. The point of view which he inculcates is nowhere better stated than on pages 115 and 116:

"The Gospel makes its appeal to the inner man, who, whether he is well or wounded, in a happy position or a miserable, obliged to spend his earthly life fighting or quietly maintaining what he has won, always remains the same. 'My kingdom is not of this world'; it is no earthly kingdom that the Gospel establishes. These words not only exclude such a political theocracy as the Pope aims at setting up and all worldly dominion; they have a much wider range. Negatively they forbid all direct and formal interference of religion in worldly affairs. Positively what the Gospel says is this: Whoever you may be, and whatever your position, whether bondman or free, whether fighting or at rest—your real task in life is always the same. There is only *one* relation and *one* idea which you must not violate, and in the face of which all others are only transient wrappings and vain show: to be a child of God and a citizen of His kingdom, and to exercise love. How you are to maintain yourself in this life on earth, and in what way you are to serve your neighbor, is left to you and your own liberty of action. This is what the apostle Paul understood by the Gospel, and I do not believe that he misunderstood it. Then let us fight, let us struggle, let us get justice for the oppressed, let us order the circumstances of the world as we with a clear conscience can, and as we may think best for our neighbor; but do not let us expect the Gospel to afford us any direct help; let us make no selfish demands for ourselves; and let us not forget that the world passes away, not only with the lusts thereof, but also with its regulations and its goods! Once more be it said: the Gospel knows only one goal, one idea; and it demands of a man that he shall never put them aside. If the exhortation to renounce takes, in a harsh and onesided way, a foremost place in Jesus's words, we must be careful to keep before our eyes the paramount and exclusive claims of the relation to God and the idea of love. The Gospel is above all questions of mundane development; it is concerned not with material things but with the souls of men."

Professor Harnack's treatment of the questions involved in the titles "Son of God" and "Messiah" as applied to Jesus Christ and of the belief in his Resurrection is eminently characteristic of the historian anxious to extract from the creeds whatever of value they may contain. The consciousness which Jesus Christ possessed of being the Son of God is, he asserts, nothing but "the practical consequence of knowing God as the Father and as his Father," and it was, he continues, closely connected with the historic idea of a Messiah which he took up and transformed. But at the same time he indicates his own view with sufficient plainness by declaring, with emphasis, that "*the Gospel, as Jesus proclaimed it, has to do with the Father only and not with the Son.*" This, he says, is "the simple expression of the actual fact as the evangelists give it." In answer to the objection that the Gospel is an antiquated belief which can have no further significance for us, he dwells with much eloquence on its "timeless" character, its relation to the inner man.

"I do not know how our increased knowledge of nature is to hinder us from bearing witness to the truth of the creed that 'The world passeth away, and the lust thereof, but he that doeth the will of God abideth for ever.' We have to do with a dualism which arose we know not how; but as moral beings we are convinced that, as it has been given us in order that we may overcome it in ourselves and bring it to a unity, so also it goes back to an original unity, and will at last find its reconciliation in the great far-off event, the realised dominion of the Good."

We now pass to the development of Christianity in the apostolic age. Paul's work in transforming the simple faith in the Fatherhood of God into a universal religion and in laying the foundations of a great Church is skilfully described. In this view Paul emerges once again as "the missioner, the teacher, the schoolmaster, the organiser." Of this transformation Catholicism was the inevitable result, more particularly after the struggle with the gnostic movement made it necessary for the Church to close up its ranks and define its boundaries if it was to survive and do its work. But with the transformation came a change that was not without many disadvantages. The acute phase of Hellenisation with which the Church was threatened may, indeed, have been avoided, but the idea began to make itself felt that "religion is first and foremost doctrine, and doctrine, too, that is coextensive with the whole range of knowledge." Other formal elements made their appearance, and alien accretions began to disfigure and disguise the original enthusiasm. The form which Catholicism assumed in the Greek Church was, says Professor Harnack, "not a Christian product in a Greek dress, but a Greek product in a Christian dress"; that is to say, it was simply the continuation of the old Greek religion under the influence of the new ideas. Christianity became a cult. Traditionalism, intellectualism, and ritualism are the fundamental notes of a Church in which "doctrine comes to be administered in stereotyped formulas accompanied by symbolic acts"; the sort of religion, as we are reminded, "to abolish which Jesus Christ suffered himself to be nailed to the cross." When Christianity in the

West took shape as the Roman Church, a structure arose "the most comprehensive and the vastest, the most complicated and yet at the same time the most uniform, that history has produced." Of the three characteristics of the Church—the Catholicism which it shares with its Greek sister, the spirit of the Roman Empire, and the religious fervor of St. Augustine, the second is incomparably the most striking to the outward eye. "The Roman Church," says Professor Harnack, "privily pushed itself into the position of the Roman World-Empire"; the Pope is Pontifex Maximus and the successor of the Cæsars. This, he continues, is the true state of the matter historically, and the most fruitful way of describing the character of the Roman Church. "It still governs the nations; its popes rule like Trajan and Marcus Aurelius; Peter and Paul have taken the place of Romulus and Remus; the bishops and archbishops, of the proconsuls; the troops of priests and monks correspond to the legions; the Jesuits to the imperial body-guard."

In the two concluding lectures Protestantism is treated not only as a reformation but also as a revolution. In both aspects what was involved, we are told, was "*a critical reduction to principles*," a return to Christianity as the word of God and the power of faith; and this return meant a protest against the whole system of legal ordinance with which the Roman Church had overlaid and obscured the Gospel. But Professor Harnack is not blind to the faults of Protestantism. "We get nothing," he says, "from history without paying for it, and for a violent movement we have to pay double." Protestantism destroyed the unity of Western civilisation. The system of State-Churches which it encouraged has many disadvantages. In laying exclusive emphasis upon faith alone, it produced some want of serious purpose in the conduct of life. Nor was Protestantism able to perceive all the conclusions to which it naturally led, much less to give them effect. The consequence was that Luther bound himself to much that cannot be otherwise described than as a variety of that intellectualism which characterised the Schoolmen. These defects have come home to the Evangelical Churches, and in our own day Protestantism is threatened by three most powerful forces—the indifference of the masses, the tendency to regard religion as a mere adjunct to life, an æsthetic consolation, and the pressure of the State view that the Churches are institutions of public utility. Against these forces what is wanted is "to maintain Christian earnestness and liberty as presented in the Gospel."

No part of this exposition of Christianity in its origin and its history is so expressive and significant as the words with which Professor Harnack brings his lectures to a conclusion. They contain a personal touch which shows us in what light the lecturer himself regards some of the obvious difficulties and perplexities of his task. Critics have complained that he leaves them much in doubt as to the views which he entertains on certain mysterious doctrines of the Christian religion. Let his own words answer them:

"Gentlemen, it is religion, the love of God and neighbor, which gives life a meaning; knowledge cannot do it. Let me, if you please, speak of my own expe-

rience, as one who for thirty years has taken an earnest interest in these things. Pure knowledge is a glorious thing, and woe to the man who holds it light or blunts his sense for it. But to the question, Whence, whither, and to what purpose, it gives an answer to-day as little as it did two or three thousand years ago. It does, indeed, instruct us in facts; it detects inconsistencies; it links phenomena; it corrects the deceptions of sense and idea. But where and how the curve of the world and the curve of our own life begin—that curve of which it shows us only a section —and whither this curve leads, knowledge does not tell us. But if with a steady will we affirm the forces and the standards which on the summits of our inner life shine out as our highest good, nay, as our real self; if we are earnest and courageous enough to accept them as the great Reality and direct our lives by them; and if we then look at the course of mankind's history, follow its upward development, and search, in strenuous and patient service, for the communion of minds in it, we shall not faint in weariness and despair, but become certain of God, of the God whom Jesus Christ called his Father, and who is also our Father."

Much praise is due to the translator of this work for the admirable manner in which he has performed his difficult task. But Mr. Saunders has only confirmed here the high reputation which he gained by his idiomatic translations of Schopenhauer's essays. T.

A History of Babylonia and Assyria. By *Robert William Rogers*, Ph. D. (Leipzig), D. D., LL. D., F. R. G. S., Professor in Drew Theological Seminary, Madison, New Jersey. New York: Eaton and Mains. Cincinnati: Jennings & Pye. 1901. 2 Volumes. Vol. I., pages 429; Vol. II., pages 418. Price, $5.00.

The story of the discovery of the history and literature of Assyria and Babylonia as narrated in these two volumes by Dr. Rogers is as fascinating as any novel. Prior to 1820, the only knowledge the world possessed of Babylon and Nineveh was derived entirely from extraneous sources, Greek, Latin, Biblical, etc.; Babylon and Nineveh themselves had always preserved the silence of the grave.

Since that year, however, great libraries have been unearthed from the ancient sites of these cities, telling of their history, their science, their architecture, their jurisprudence, their religion, and their ethics, all written in an absolutely unknown language, which it remained for scholars to decipher. It is interesting to observe that the restoration of the life of Babylonia and Assyria and the decipherment of the cuneiform script of the Babylonians and Assyrians did not begin in connexion with Babylonia and Nineveh themselves, but took their origin in a far distant spot in Persia, in the ruins of Persepolis, the ancient capital of the Persian kings. These ruins the very earliest travellers had admired, and incidentally had discovered certain curious inscriptions written in wedge-shaped, arrow-headed characters. The first step in the decipherment of these inscriptions was taken in 1621 in a guess

made by a traveller, Pietro Della Valle, that the characters were to be read from the left to the right. This was afterwards confirmed by examination of more accurate copies of the inscriptions made by Sir John Chardin, in 1643. Kaempfer, a German Japanese and Oriental scholar, later took up the problem as to whether the characters were ideographic, syllabic, or alphabetic, but naturally could not arrive at a convincing conclusion with the data at his command. The traveller Niebuhr, father of the great historian, (1767) made more accurate and extensive copies of the inscriptions, and was lead to the conclusion that there were three separate systems of writing embodied. It did not occur to him that three languages were here represented, but he divided the inscriptions into three distinct classes and by careful comparison was able to show that only forty-two distinct signs were used. His list of signs was so nearly complete and so accurate that later study has made but little change in it. Niebuhr could now safely draw the conclusion that this language, whatever it might be, was written in alphabetic characters. This was a decisive step in advance; but Niebuhr did not possess sufficient linguistic or historical training to go farther. Tychsen of Rostock (in 1798) noticed a diagonal wedge in the inscriptions and suggested that it was the dividing sign used to separate words; he also declared that all the inscriptions of Niebuhr with one exception were written *in three different languages*. A very important historical conjecture was then made by Münter, of Copenhagen, to the effect that the builders of Persepolis were of the dynasty of the Achæmenides who reigned *circa* 730–330 B. C.; this conjecture afterwards enabled Grotefend to hit upon the names of certain kings. Münter also recognised the vowel *a* and the consonant *b*. "This was the first sure step in the decipherment. From our present point of view it may sound small, but it is to be remembered that it was made without the assistance of any bilingual text, taken bodily out of the darkness and gloom which had settled over this language centuries before. It was an achievement far exceeding that of the Egyptian hieroglyphics, which was secured by the aid of a bilingual text containing Greek. The name of Münter may well be held in honor among all who covet knowledge of the past of the Orient."

Three great French Orientalists, Duperon, Burnouf, and De Sacy, now came forward, and the problem was attacked linguistically from the point of view of comparative philology. Duperon, after great hardships, mastered the Avestan language, and published (1771) the sacred books of Zoroaster. His decipherment of the Avestan supplied the grammatical structure and part of the vocabulary of a language spoken over the same territory as the ancient Persian, and it was likely that many of the old words had been taken up from the ancient tongue, that its structure, declensions, etc., resembled in some respects the old Persian. De Sacy, the greatest Arabic scholar of his age (1787–1791), deciphered the inscriptions written during the Sassanian period in the Palevi character (227–641 A. D.). Here too, it was likely that the style of the Sassanian inscriptions had been copied from the style in which the more ancient Achæmenian scribes had written. De Sacy

found that one stereotyped form in particular was used in which there was scarcely any departure. It was as follows:

"*N., the great king, the king of kings, the king of Iran and Aniran, son of N., the great king, etc.*"

It was with these data that Grotefend of Göttingen, a classical scholar and not an Orientalist, but a prince of decipherers, began his labors. Taking Niebuhr's inscriptions, he assumed that since they accompanied the figures of kings they were titles of these monarchs and were presumably similar to the inscriptions of the Sassanian kings which De Sacy had just deciphered. It had previously been found by Münter that frequently a certain word appeared in these inscriptions in a short form and then again in a longer form, and the conjecture was immediate that in the latter case some grammatical termination had been added. Grotefend, taking the Sassanian formula as his analogue, was persuaded that this word meant *king* in the shorter form and that when it appeared twice in other places, in both the shorter and the longer form, the expression meant *king of kings*. Further, in both inscriptions in the first line this same word occurred a second time, followed in both cases by another word, likewise in both cases the same. Referring to the Sassanian inscriptions, Grotefend concluded that the word meant *great* and the entire inscription *great king*. But all this was conjecture. The words had not yet been alphabetically analysed, and it was to this analysis that Grotefend now bent his energies.

In the Sassanian inscriptions the first word was always the king's name; this was also probably the case in these Persian cuneiform inscriptions. If it were, then the inscriptions were set up by different kings, for the first words in the two cases were different. But the name with which the first began appeared in the second with its ending changed. From its situation in the two places, Grotefend concluded that the first was the name in the nominative and that the second was the name in the genitive, and thus the first inscription would begin: "*N., great king, king of kings*"; and in the second the word in its variant form would be equivalent to "*Of N.*" In the second inscription, this name was further followed by the word for *king*, and after this came another word which, after the analogue of the Sassanian inscriptions, would naturally mean *son*. And hence the whole phrase in the second inscription would run in the transposed order of this ancient language: "*Of N. king son*," meaning "*Son of N. king.*" But the same word *son* also occurs in the first inscription, following a name not possessing the title of king. From all this, Grotefend surmised that he had in these two inscriptions the names of three rulers: (1) the grandfather who had founded the dynasty, but was himself not a king; (2) the son who succeeded him and bore the title of king; and (3) the grandson who had also the same title.

Now, it was known by the discovery of Münter that the age of this inscription was the age of the dynasty of the Achæmenides, and it now only remained to search in the annals of this dynasty for three names that fitted the case. The first names

thought of were Cambyses, Cyrus, and Cambyses, but since the names of grandfather and grandson were here exactly alike, while on the inscriptions they were different, the conjecture failed. The next three considered were Hystaspes, Darius, and Xerxes. If this last assumption were correct, then the seven signs with which the first inscription began must be the name Darius, and the next thing to do was to find the form of the name Darius in ancient Persian. This was a difficult task, as the Greeks, in transliterating Oriental names, were exceedingly careless; but from a clue in Strabo and from the Hebrew form of the word he ventured upon the form Darheush, in which, as later inquiry showed, there were only two errors, namely that of *h* and *e*. Since nearly all the same letters were used in the second word, the transliteration of the latter was comparatively easy. The third name was also conjectured, with only two errors. The result was that Grotefend felt confident of having discovered thirteen of the forty-two alphabetic characters of which the Persian alphabet was supposed to be composed. It was an epoch-making result, and met with the usual fate of such achievements: The Göttingen Academy of Sciences refused to take the risk of disgracing itself by publishing Grotefend's paper, which saw the light of day soon afterwards as an appendix to the work of the great Göttingen historian, Heeren.

Grotefend had accomplished wonders; but not being an Oriental scholar he was now "at the end of his Latin," or rather, of his Persian. He did not have the Oriental spirit; he did not have an historical feeling for the Oriental environment. But it was he who first learned how to read an ancient Persian word, and from this in due course came the power to read the words of Babylonian and Assyrian. "To very few men," says Dr. Rogers, "has it happened to make discoveries of such moment."

Burnouf, the great French Orientalist, at once espoused Grotefend's cause, and brought his enormous Oriental learning to bear upon the problem. Burnouf had given the grammar of the Avestan a scientific basis, to which he added a knowledge of Persian life and religion which no one then possessed. He took one of Niebuhr's inscriptions that gave a list of the names of countries, and knowing these countries from other sources he found the equivalent for almost every character in the Persian alphabet. He next determined that the old Persian was not the same language as Avestan, but was closely related to it, and hence that all the Indo-European languages would contribute great light to the study of old Persian.

Lassen and Westergaard followed with more discoveries. An English officer, Major (afterward Sir) Henry Rawlinson, crowned the labors of all. His opportunities enabled him to copy and study many inscriptions inaccessible in Europe, and although his work was carried on under great difficulties, of which European scholars had never dreamed, he was successful in making an intelligible and connected translation of the long inscription of Darius on the rocks at Behistun, which he had copied at the risk of his life, beneath the blazing sun. Although he was early in communication with Burnouf and Lassen, his first work seems to have

been entirely independent of European influence, and is remarkable as having been strikingly similar to that of Grotefend. A third investigator, the Rev. Edward Hincks, a quiet country rector at Killyleagh, County Down, Ireland, one of the pioneers of Egyptian decipherment, also arrived independently at the translations of some of the Persepolitan texts. Says Dr. Rogers: "The work of decipherment was now over as far as the ancient Persian inscriptions were concerned. There was, of course, much more to be learned concerning the language and concerning the historical material which the inscriptions had provided. On these and other points investigation would go on even to this hour. But the pure work of the decipherer was ended, the texts were read. A language long dead lived again. Men long silent had spoken again. It seemed a dream; it was a genuine reality, the result of long and painful study through a series of years by scores of men, each contributing his share."

Such in brief is the romantic account as told in full by Dr. Rogers of the decipherment of the Persian cuneiform inscriptions of Persepolis; and now as to the bearing of this story on Assyrian, wherein we can be brief.

The mounds of Nineveh and Babylonia prior to the seventeenth century were known only to the traveller. The history of these cities was accessible only to the Greeks and the Latins and from some allusions in the Old Testament. In the eighteenth and the early part of the nineteenth centuries, the real explorations began. Niebuhr, Beauchamp, and Olivier determined the sites of these ancient cities; cylinders were discovered covered with a writing resembling the inscriptions of Persepolis; and James Rich and Sir Robert Kerr Porter, two Englishmen, by their enthusiastic descriptions aroused European interest to the highest pitch. Then followed the wonderful period of excavations, from 1843 to 1854, which were at first almost exclusively conducted by the French under Botta, and afterwards by the English under Layard and Rawlinson.

The results of these excavations ending in the astounding discovery of Rassam of the library of the royal city of Nineveh, gathered by Assurbanipal, were finally laid before the historians and linguists of the Orient for decipherment. The story is too long to give in full here. The task was accomplished in immediate connexion with the reading of the ancient Persian cuneiform inscriptions at Persepolis.

It will be remembered that only the first of the three languages found in the inscriptions at Persepolis had been deciphered; this was the ancient Persian. The second language was thought to be that of the Scythians or that of the Medes. It was here that Grotefend failed. Westergaard, Hincks, De Saulcy, Sir Henry Rawlinson, Sayce, Norris, Oppert, Loewenstein, and Talbot, were the great names in the decipherment of Assyrian and Babylonian inscriptions down to the year 1870, and by their labors the art may be said to have reached an assured position. The study of Assyrian began to take its place by the side of its older sisters in the universities; the material which Botta had sent to Paris, the inscriptions which Layard, Loftus, Taylor, and Rassam were sending to London, were quickly read, and

the history, religion, and literature of the ancient monarchies were more and more clearly elucidated. The decipherment of the Sumerian and Vannic languages followed with the excavations and explorations of the period between 1872 and 1900.

The new material, much of which has been gathered by the University of Pennsylvania, has not yet been fully exploited, but a vast amount of it has been interpreted, sufficient to give an elaborate picture of Assyrian and Babylonian history, civilisation, culture, religion, and modes of life. This Dr. Rogers has attempted to do in two large volumes, the interest of which may be gathered from the foregoing synopsis of a part only, and from the fact that the work, although written last year, is now in its second edition. μ.

LEHRBUCH DER PHYSIOLOGIE DES MENSCHEN. Von *G. von Bunge*, Professor in Basel. Erster Band: Sinne, Nerven, Muskeln, Fortpflanzung, in Achtundzwanzig Vorträgen. Mit 67 Abbildungen im Text und 2 Tafeln. Leipzig: Verlag von F. C. W. Vogel. 1901. Pages, viii, 381. Price, 10 Marks.

A work on human physiology by the distinguished professor of that branch in the University of Basel, Switzerland, will be welcomed on many sides. Not only has Professor Bunge displayed in his professional activity a wide acquaintance with physical and chemical science, but he has also come prominently before the scientific public as the representative of a new species of vitalism in biology. The old doctrine of vital or hyper-mechanical force which dominated the eighteenth century and still lingered in the thought of Johannes Müller, the greatest physiologist of history, has found its reviviscence in the last few decades in the persons of many eminent modern inquirers; and it has, in the variations which the modern scientific point of view has imposed upon it, been joyously received, and put to the most varied religious and teleological uses, by mystics, reactionaries, and devotees of esotericism in general, as well as by earnest religious thinkers. Most pronounced in the resumption of the old vitalistic view have been the botanists Hanstein and Kerner von Marilaun, and the pathologist Rindfleisch. The neo-vitalism of Bunge, however, is more philosophically established and more scientifically grounded than the majority of these vagaries, and it has, in its fundamental principles at least, much support from philosophical quarters. It must be noted, nevertheless, that the tendency of science at the present moment is in the opposite direction, and that the recent important discovery of mechanical and physico-chemical analogies to vital phenomena have rather weakened than strengthened Bunge's position in its full extent. As for Bunge himself, he openly accepts the tenets of the ancient vitalistic creed when he says in his *Physiological and Pathological Chemistry* (1889): "I must emphatically differ with you if you think you can refute vitalism by saying that there are no other factors active in living beings than the forces and materials of inanimate nature alone." On the other hand, it appears that Bunge's vitalism is nothing more than the expression of his philosophy of subjective idealism, which holds that it is a reversal of the true order of things to explain psychi-

cal processes by the mechanics of atoms. Bunge says, in the work before quoted: "The science of vitalism is simply the adoption of the only genuine and correct method of scientific inquiry, which is that of starting from the known or inner world, and attempting to explain the unknown or outer world." In other words, his vitalism is simply a statement of the fact that it is impossible to resolve psychical processes by the physics and chemistry of matter. And in doing so, Bunge sets up the old dualistic dogma of a contrariety between the living and the lifeless, between unsouled and ensouled nature. This has led him to the assumption of the principle of the eternity of life in the universe, analogous to the physical law of the eternity of matter and energy. Since the speculations which have led him to this conclusion are interesting, however weak and unconvincing they may seem to positive and more critically trained minds, we shall give a brief synopsis of them, and of the scientific grounds on which they rest.

The question of whether a living cell can be built up from dead matter, whether spontaneous generation or abiogenesis is possible, cannot be decided in the present state of our knowledge. Its possibility must at least be admitted even though the experiments to establish it have turned out negatively, for we can never fulfil all the conceivable conditions of such a process. Yet, while all experiments have hitherto proved futile, the majority of biologists have concluded, from the fact that our earth was once a fiery mass like the sun of to-day from which it separated, that life could not possibly have existed upon it in the beginning, and that there must have been a period of time at which the first cell was formed from inanimate matter.

Now, Bunge believes,—and the grounds of his belief will have different weight with different minds,—that this doctrine was greatly invalidated by the considerations advanced by the German physician Richter (1808–1876), a professor of medicine in Dresden. Richter's theory is well known to scientists, and is not in the best repute in all quarters. Richter maintains that it was possible after the earth had cooled, for the first living cell to have reached it from some other heavenly body. His arguments are that the universe is infinite in time and space; it never began and will never cease. Matter and energy are indestructible. The sole thing that incessantly changes is form. Space is filled with originating, with matured, and with dying celestial bodies, where by "matured" is understood such as are capable of sustaining organic life. Consequently the existence of organic life in the universe must be held to be universal. It has existed from all eternity, has propagated itself in organised form, not as a mysterious primordial viscous slime, but as living organisms, as cells, or as individuals composed of cells. *Omne vivum ab æternitate e cellula!*

This disposes of the question of the origin of the first organisms, but granting that such have always existed in the world, how could they possibly have found lodgment upon this or that particular heavenly body, which, from having been uninhabitable, has become habitable. Richter answers: "Directly out of space."

Countless masses of minute substances are hovering in space, from the tenuous tails of comets to the meteoric stones which incandesce in our atmosphere, and sometimes fall to the earth. Remnants of organic substances (carbon) have been found in these. The question whether these organic substances before being destroyed by the incandescence of the meteor were composed of formless primordial slime or of formed organised structures, is to be answered in favor of the latter; for we have an analogue of the occurrence in our own atmosphere. If air be filtered through cotton, microscopic organic bodies will invariably be found in it. The equatorial winds carry great quantities of infusorial dust from Africa and South America, high over the Alps and the Pyrenees, to central Europe. The snow of the Alps may sometimes be seen covered with red infusoria. But if microscopic organisms hover so high in the atmosphere of the earth, and consequently equally high in the atmosphere of any other inhabited heavenly body, it would be quite easy for them to be attracted into space by passing comets or aerolites, and to be subsequently deposited upon another habitable world, and there spontaneously developed into higher forms. So far, Richter.

Two eminent physicists, Helmholtz and Lord Kelvin, have also tentatively admitted the possibility of the cosmic origin of life. The main objection to this theory is the low temperature of cosmic space, namely —273 C., which is such that whether the germs clung to meteoric stones or hovered free in the ether, they would be totally destroyed by the cold. Bunge remarks in this connexion that it is to be remembered that the very simplest organisms, especially spores, can endure very low temperatures. Pictet and Yung subjected bacteria to a temperature of —130 C., and found that some species remained alive even at this low temperature. "Why," Bunge asks, "should not spores exist capable of surviving the journey through the frigid regions of space?" Another objection is that, granting that organic germs might accidentally escape the destruction of their ancestral planets, they could not possibly escape destruction from the heat generated by the passage through the terrestrial atmosphere of the meteorites to which they cling.

It would seem to be asking a great deal of organic germs that they should be able to survive temperatures ranging from absolute zero to that required to volatilise all known metals; but neither Helmholtz nor Professor Bunge is disconcerted by this astonishing display of powers of endurance. Helmholtz contends that the larger meteoric stones are heated only in their outer layers in their passage through the earth's atmosphere, and that germs might lie hidden in the interstices of the interiors; or they might be blown off by the rush of the air before the meteor is ignited; while as for their escape from destruction from the possible annihilation of two colliding planets, Lord Kelvin has shown that the first consequences of such a collision would be mechanical movements only, and that heat could not be produced until these mechanical movements were destroyed by friction,—which might take hours or days, and would consequently not interfere with the escape into space of planetary fragments broken off at the outset. And, as for the de-

struction of the germs by the heat generated in the earth's atmosphere, Professor Bunge points to the new experiments which show that certain spores are capable of enduring a temperature of from 110 to 140 degrees Centigrade.

To sum up, in view of the fact that the mystery of primitive generation still remains unsolved, Professor Bunge is fain to conclude that there is no reason whatever for assuming that organised life ever originated on our planet, that the possibility must be admitted that living cells never sprang from inanimate matter, but have been endowed with life eternally. The notion of life's being limited either in space or time is, he thinks, but the monstrous product of human limitations.

Such is a specimen of the character of Professor Bunge's book. It embraces the widest interests, philosophical as well as scientific, and when not concerned with Professor Bunge's special vitalistic point of view, is of course less speculative. The lectures are historical as well as expository, one of the most interesting of them being devoted to placing the achievements of Gall in the right light; persons in whose minds Gall is always associated with phrenologic extravagances should read this chapter. The lectures on heredity, propagation, animal electricity, hypnotism, sleep, etc., are also interesting from a broad point of view. The other lectures treat in a very simple and intelligible manner of the usual subjects of physiological text-books, such as the specific energies, the senses, the physiology of the brain, etc., etc. That Professor Bunge does not omit in some cases to strike even a religious note, may be gathered from the following quotation which ends his reflexions on the nature of propagation, individual and racial, and on the continuity of life:

"Weismann enunciated the doctrine that unicellular organisms have life im-
"mortal, for the reason that it can never be said after division which cell is the
"daughter cell and which the mother; each is as old as organic life itself. And
"the same is true of the highest organisms; each cell of a body has lived forever,
"and no cell, whether spermatozoic or ovarian, which has separated from the
"other cells, is older than any that has remained behind. Each cell has the right
"to say: 'I am the cell primordial.'—We live forever. And this is true even of
"those who have no direct descendants; they are one, by collateral lines, with all
"the coming generations. Indeed, the direct descendants of the great majority of
"men die out after a few generations.

"The future generations are we ourselves. We continue to live in those that
"come after us. Never has any religion, as the physiologist Victor Hensen has
"remarked, given adequate expression to this idea. It will constitute the founda-
"tion of every religion and ethics of the future. All the good that we have done
"in life redounds to our own advantage. And so even selfishness is forced into
"the service of unselfishness; all motives work in concert for the perfection and
"ennoblement of life. Even death has been robbed of its sting: the death of an
"individual annihilates nothing of life. Individuals perish, millions and millions

"each second. But life ceases never a moment. What does nature care for the "individual? What is the significance of the continuity of individual conscious- "ness? We forget the old pains. We awaken in new forms to new hopes and "new battles. Spring of eternal youth, immortality of life perennial, joyance "never-ending and ever-renewed!" μ.

GUSTAV THEODOR FECHNER. Rede zur Feier seines hundertjährigen Geburtstages gehalten. Von *Wilhelm Wundt*. Mit Beilagen und einer Abbildung des Fechner-Denkmals. Leipzig: Verlag von Wilhelm Engelmann. 1901. Pages, 92. Price, 2 marks.

It is unnecessary for us to recall in full the details of the life and career of Gustav Theodor Fechner. Let it suffice to give Wundt's views of the philosophical standing of this great inquirer and thinker, founder of modern experimental psychology, and reviver of the *Naturphilosophie* of Schelling, and to point out the dominant notes of his career.

Fechner was primarily a natural inquirer, his departments having been physics, chemistry, and general medicine. He was the translator, compiler, and editor of many text-books in these different branches, and subsequently an author of philosophical, ethical, and mystical writings. He was first concerned altogether with the solution of concrete problems, and it was through the methodology involved in his exact scientific labors that his attention was directed to philosophy. This philosophy was half humorously and half seriously expounded in treatises bearing the titles of (1) *The Comparative Anatomy of Angels* (1825), the *Booklet of Life and Death* (1835), *Nana, or the Psychic Life of Plants* (1848), the *Zend-Avesta* (1851), etc., etc.; it being important to note in this connexion that Fechner's epoch-making works on *Psychophysics* appeared subsequently to his mystical philosophical writings.

The view that not only men and animals, but also plants, the earth itself, the planets and the fixed stars, are ensouled beings, is shared by Fechner's system in common with many other imaginative philosophical constructions, but in his case it may be shown to be an independent, intellectual creation, and its scientific justification stands on an entirely different footing from that of the ancient, mythological systems. Fechner was acquainted with Schelling, he had read parts of Oken, but whatever impulse he may have received from their speculations, his own had always been carried on in connexion with the newer and more critical development of science. The scientific discoveries of the time of Schelling and Oken were tremendous, but the philosophical interpretation of these results had made so little advancement, and the critical attitude of the mind generally had been so slightly developed, that Schelling and Oken might well be pardoned for their indulgence in fantastic speculations and for their having produced so little of lasting value. Fechner, on the other hand, had the advantage of a more exact science, of a more critical scientific philosophy, and consequently his conception of the world, poet-

ical and fantastic as it may have been, was nevertheless in closer contact with genuine inquiry; and it is consequently not surprising that by his efforts to support and substantiate his philosophical system he produced results of real scientific worth.

Fechner's philosophical, we might almost say theosophical, doctrine of panbiotism and pan-psychism, of the graduated structural constitution and development of all animate creatures, took its origin and growth independently of his scientific works. His exact scientific research was subordinated to his philosophical points of view. From the *Zend-Avesta* sprang his *Atomic Theory;* also his *Ideas on the History of Creation and Evolution*, and foremost of all his great work on *Psychophysics*. In his *Psychophysics* was expounded the law of the limits, range, and gradations of sensation, etc., corresponding with which he conceived analogous, parallel systems, ranges, and limits of sensation in the remainder of the world. His psychophysics, it will be seen, was thus a weapon for the defence of his philosophy. Its ultimate aim was the conversion of the scientific world to his peculiar philosophical and religious convictions. But of this work only the scientific results (his law of the threshold of sensation, his experimental methods for determining the relations between stimulus and sensation, his extension of Weber's law, etc.) attracted notice, received criticism or confirmation; his philosophical views of the relation subsisting between the individual consciousness and the collective consciousness lying below the threshold of the individual consciousness, and the consequent psychophysical structural gradation of the entire universe,—these views for which all the science of the book had served as a foundation, were received with condemnatory silence. Few psychologists have even read the parts in which these conclusions were set forth.

Fechner himself was sorely disappointed at what he regarded as the lack of success of his metaphysical efforts, and he was even inclined to think that the tenability of his experimental results was indissolubly bound up with the tenability of his antecedent mystical, philosophical conclusions. It was so with Kepler, who in the discovery of his famous third law of planetary motions was guided solely by his fantastic speculations concerning harmonic intervals and the Platonic solids and saw in it only the key-stone of his grand arch of mystical cosmic harmony. But Kepler's cosmic harmony has long since vanished and left not a rack behind; while his third law has become the foundation of a theory of which the beauty and the poetry have taken a much purer and a much exacter and more classical form. And so it is with the mystical parts of Fechner's *Psychophysics;* what shall remain unforgotten is the fact that he was the first to introduce exact methods and exact principles of measurement and experimental observation into psychological inquiry, and that he thus first rendered scientific psychology possible in the most rigorous sense of the word. The results that he accomplished were entirely the outcome of metaphysical notions, and since he looked upon them solely as devices for the enforcement of his metaphysics, he naturally underestimated their scope and impor-

tance. But to-day we know that far from being tainted by their metaphysical connexions, they have actually contributed most toward stripping psychology of its metaphysical character.

And now as to the position of Fechner's metaphysical system in the history of philosophy. Philosophy, according to Professor Wundt, is not an absolutely definite conception. There are two distinct species of thought traceable throughout all the history of philosophy. The first species seeks to epitomise the science of its time and to crystallise it into a systematic conception of the universe. Most perfect in this respect was the philosophy of Aristotle, in which the science of antiquity was focussed, and which dominated human thought for many, many centuries. Next in order, perfection, and influence were the systems of Descartes and Kant. The second species of philosophy, on the other hand, does not strive to be rigorously positive and scientific; but, dissatisfied with the results of purely rational thought, it seeks to construct its concepts of the universe by the aid of the imagination, and so aims to satisfy the longings of the heart, and to cast its searching eyes beyond the bounds which patient and plodding inquiry have marked out. This species of philosophy is wedded to poetry, and carries thought back to its ultimate source, in the mythological imagination. The greatest thinker of antiquity, Plato, took refuge in philosophical poetry and mythology wherever rigorous thought failed him; and it is the opinion of some that on this side of its development his system has been greatest and most effective. It is to this second species of philosophy that Fechner's system belongs,—to the domain of poetry and mythology combined. Philosophy for him was a matter of belief, not of knowledge. And if the philosophical offspring of poesy and fantasy be entitled to any rank and recognition in the republic of thought, as most will say they are, then Fechner's philosophy too may justly lay claim to lasting position and consideration. Such is Professor Wundt's view.

The present brochure, which is an address delivered in commemoration of the hundredth anniversary of Fechner's birth, contains as a frontispiece a photogravure of the monument erected to Fechner's memory in the Rosenthal at Leipzig; and in addition to Professor Wundt's excellent sketch of Fechner's philosophical significance contains matter in the way of personal recollections and expositions of Fechner's psychology and esthetics and of Fechner's relations to spiritualism, that are new and consequently will be of interest to the public. *u.*

THE LIMITS OF EVOLUTION AND OTHER ESSAYS. Illustrating the Metaphysical Theory of Personal Idealism. By *G. H. Howison, LL. D.*, Mills Professor of Philosophy in the University of California. New York: The Macmillan Company. London: Macmillan & Co., Ltd. 1901. Pages, xxxv, 396.

It is pleasant to compare the work of Professor Howison with the ordinary run of professional philosophical treatises. Where they (and most notably the Continental books) scarcely ever deign to give the inquiring reader the least clue to their

contents and purpose, he has given us in an admirable preface a precise summary of his doctrine, and has added so excellent an index and analytical table of contents that no one can be pardoned for miscomprehending his philosophy. The book is a collection of essays on topics bearing such titles as "The Limits of Evolution," "Modern Science and Pantheism," "Later German Philosophy," "The Art Principle as Represented in Poetry," "The Right Relation of Reason to Religion," "Human Immortality," "The Harmony of Determinism and Freedom,"—all apparently of a divergent character, but having withal a common and definite trend of thought applied to all the main concerns of human life, viz., to science, art, and religion.

Professor Howison has given his metaphysical theory the title of Personal Idealism. As to the objection to the epithet *personal*, he replies "that the actual history of philosophic thought, even after philosophy attains to the view that rational consciousness is the First Principle, exhibits a singular arrest of the movement toward putting complete personality at the centre of things. Historic idealism is, in fact, far from being personal; rather, it is well-nigh overwhelmingly impersonal." In its search after unity, the ideal of the monistic system, philosophy, whether materialistic or idealistic, he contends has always lost sight of its other interests, of which some are at least as great. The prevailing tendency has always been toward some form of monism, the absorption of all things, including individual minds, either in a single material Substance or in a single conscious Subject. Leibnitz alone, in the long history of idealistic thinking, has broken with the monistic tradition. The main drift of philosophic thought in the Western world for the past century has, surprising as it may seem, been increasingly toward the Oriental view of things, and has been at direct variance with the Occidental's instinctive preference for personal initiative responsibility and credit; and Professor Howison accordingly declares himself glad of an opportunity "to protest with him against this all-engulfing monism, fatal to our moral freedom even when taking on the plausible form of monistic idealism." Even idealistic monism, which he regards as a real philosophic advance on other forms of monism, is irreconcilable with personality; it annuls moral agencies and personal freedom in all conscious beings other than its so-called god, and so leaves its professed god without so much as a vestige of genuine personality. Now, it is the aim of the present collection of essays, says Professor Howison, to present "an idealistic system that shall be thoroughly personal in the sense just implied. Instead of any monism, these essays put forward a Pluralism: they advocate an eternal or metaphysical world of *many* minds, all alike possessing personal initiative, real self-direction, instead of an all-predestinating single Mind that alone has real free-agency."

In Professor Howison's philosophy, the ideal is central and determinative, the measure of all other reality. A composite of suggestions derived from Berkeley, Leibnitz, and Kant, this philosophy has pushed the idealistic, as well as the individualistic, principles to their furthest limits. We shall give in a few dogmatic

statements, in Professor Howison's own words, a summary of his position with regard to the great metaphysical problems.

All existence, he says, is either (1) *the existence of minds*, or (2) the *existence of the items and order of their experience*. Time and space, thus, owe their existence to the essential correlation and coexistence of minds. The mutual recognition of all minds as alike self-determining renders their coexistence *a moral order*. "These many minds, being in this mutual recognition of their moral reality the determining ground of all events and all mere 'things,' form the eternal (i. e., unconditionally real) world; and by a fitting metaphor, consecrated in the usage of ages, they may be said to constitute the 'City of God.' . . . The members of this Eternal Republic have no origin but their purely logical one of reference to each other, including thus their primary reference to God. . . . They have no origin at all—no source in *time* whatever. . . . They simply *are*, and together constitute the eternal order. They exist only in and through their mutually thought correlation, their eternal 'City,' and out of it would be non-existent. But through their thought-reciprocity with each other, God being included in the circle, they are the ground of all literally originated, all temporal and spatial existences. Hence, relatively to the natural world, they are free, in the sense of being in control of it: so far from being found *by* it and its laws, they are the very source of all the law there is or can be in it. Relatively to God also, and to each other, all minds other than God are free, in the still higher sense that nothing but their own light and conviction determines their actions toward each other or toward God. . . . This Pluralism held in union by reason, this World of Spirits, is thus the genuine *Unmoved One that moves all Things*. . . . Its oneness is not that of a single inflexible Unit, leaving no room for freedom in the many, for a many that is really many, but is the oneness of uniting harmony, of spontaneous coöperation, in which every member, from inner initiative, from native contemplation of the same Ideal, joins in moving all things changeable toward the common goal. This movement of things changeable toward the goal of a common Ideal is what we have in these days learned to call the process of Evolution. The World of Spirits, as the ground of it, can therefore neither be the product of evolution nor in any way subject to evolution."

As to creation, it is not an event, an act causative and effective in time; it is simply "such an eternal dependence of other souls upon God that the non-existence of God would involve the non-existence of all souls, while his existence is the essential supplementing Reality that raises them to reality; without him, they would be but void names and bare possibilities."

After the preceding statements, one will not be surprised to learn that the key to the whole view is to be found in its system of causation, which substitutes final cause for efficient cause; final cause being not merely the guiding and regulative, but actually the grounding and constitutive, principle of all real existence. A more absolute idealism it would be impossible to conceive. It solves admirably, for instance, the problem of personal freedom, but its solutions are entirely metaphys-

ical, and the system generally is unsupported by positive research. In this sense, we can scarcely see that Professor Howison's metaphysical predications concerning the nature of the moral order, the city of God, the interrelations of God and the individual minds, the process of evolution, the nature of creation, etc., are less "assumptions" than Berkeley's flat and unqualified postulation of a Divine Mind supporting and containing individual spirits. True, there is much more ado about the process by which the assumptions are reached; the reader is "led" to the assumptions through what Professor Howison terms "a logical continuum," and by means of a "transcendental principle." But analysis will show that ultimately Berkeley's position is just as well grounded, is just as rich in implications as Professor Howison's, not to speak of its being far simpler.

Much is to be said of Professor Howison's treatment, however, for the insight which it gives into the methods and the state of modern metaphysical speculation, and for his brief historical exposition of the views of Hartmann, Lange, and Dühring, the latter of whom is not as well known to American readers as he should be. The work may indeed be studied with profit by all students of metaphysics. *μ.*

THE PROBLEM OF CONDUCT. A Study in the Phenomenology of Ethics. By *Alfred Edward Taylor*, Assistant Lecturer in Greek and Philosophy at the Owens College, Manchester; Late Fellow of Merton College, Oxford. London: Macmillan & Co., Ltd.; New York: The Macmillan Co. 1901. Pages, vi, 501. Price, $3.25.

Mr. Taylor has given us in this volume a searching and comprehensive examination of the ethical problem, and has shown in his *résumés* and discussions generally a thorough mastery of the world's literature as well as its philosophy. The book is substantially the same as that which obtained the Green Moral Philosophy Prize in the University of Oxford for the year 1899, although it is far from agreeing in every point with the doctrines of the eminent English thinker in whose memory the prize in question was founded. We shall endeavor to indicate Mr. Taylor's position with respect to the main question of philosophy, the question of method, which here chiefly concerns us, by a few quotations; we shall see that his work has many sound elements to recommend it.

"All knowledge," he says, "according to our view, is empirical in the sense of being concerned in the last resort with the description of matters of fact or experience. But not all the branches of study treat the experienced facts which it is their business to ascertain and describe in one and the same way. The attitude of each of the ordinary departmental sciences to the great body of experienced facts which make up the life of the world may be said to be characterised at once by more or less strict limitation of range of vision, and by the endeavor, within a limited range, to take account of all important or typical facts. Comparative narrowness of range and accompanying fulness of detail within that range, these are the distinctive marks of the sciences which are called sometimes natural, some-

times positive, sometimes empirical, in each case with a certain conscious opposition to more philosophical or metaphysical or speculative forms of study. . . . For practical purposes this one-sidedness does not matter, so long as a science is successful in establishing links of connexion and detecting uniformities within that special aspect of experience to which it avowedly confines its attention; it is only when, as philosophers, we try to form some general conception of the nature of experienced reality as a whole, that it becomes important to insist on this peculiarity of scientific procedure, and to beware of being led, by overlooking it, into taking as the fundamental character of all reality what may be true only of some one aspect or part within the whole. . . . Instead of taking a part of the facts of life and trying to get as much detailed insight into them as possible, we may conceivably sit down to study experience and experienced facts broadly as a whole, and to ask, without attending to special matters of detail, whether we can detect any general characteristics which belong, not to this or that class of facts, or to this or that aspect of experience, but to the facts of life or the contents of experience viewed as a whole. If any such most fundamental characteristics of the world of experience are to be discovered, we clearly have in them the materials for such a science as was called by Aristotle Theology or First Philosophy, and by his editors metaphysics,—a science, that is, which aims at enunciating results which shall be true of things not merely in so far as they have extension, or outline, or movement, or any other special quality by which some one subsidiary class of experienced facts is differentiated from others, but universally and without restriction of all experienced contents whatever."

Now, Mr. Taylor contends, as many have contended before him, and will contend after him, "unto the last syllable of recorded time," that such a science is not only conceivable but actually possible. For "with all their infinite diversity, the facts of life present at least one common characteristic. Whatever else they may be, the facts upon which all our sciences are founded are all what the German language can describe by the convenient word *Erlebnisse*, things through which we have lived, bits of the experience of individual centres of thought and feeling. And since the ultimate aim of all the sciences is, as we have seen, to give such an account of the facts of experience as shall be consistent with appearances and with itself, we may fairly say that all scientific progress consists in the more and more adequate rendering of experience, or in the freeing of our descriptions of experience from the 'symbolic' elements which, as we have seen, enter so largely into our scientific hypotheses.

"We are thus led," the author continues, "by reflexion on the nature of scientific progress to the conception of the scientific ideal as a perfect or completed or pure experience, an experience which embraces not some merely, but all the events and processes which are the contents of the experience of ourselves and all other centres of thought and feeling, and beholds them as a single coherent and harmonious system, without any of the gaps, confusions, and contradictions insep-

arable from imperfect and symbolic knowledge. Such an all-embracing and finally consistent experience would in every case see things as they really are. Theory for it would be one with direct experience, and thus for it the ideals at which we are consciously or unconsciously aiming in all our thinking would be translated into actual facts. Whether such a complete or pure experience, with the whole of reality for its object, actually exists is a question which need not and must not be raised at this stage of our argument, but even if we suppose it to be nothing more than a mere 'regulative ideal' which actual knowledge is always approaching but never reaches, it is easy to see its enormous value. For it clearly affords us a standard or criterion by which to measure the degree of truth contained in the various conceptions of the general character of the world of reality."

The science embodying this ideal, now, is metaphysics, and it is "the business of metaphysics to test the various theories and propositions which pass for true in our everyday thinking or in our sciences by comparison with the ideal standard of a 'pure' or perfect experience, and to decide how far all or any of them satisfy the two requirements of agreement with the formal conditions of experience in general and with the material conditions of the particular experiences which they claim to represent."

Such, then, is the scope and function of metaphysics. And having reached a theory on this point, the next question to be asked is, What are the relations of metaphysics to the special science under consideration, viz,, *ethics*?

Here Mr. Taylor is opposed to the metaphysicians. He would not start from a purely "formal" conception of good or of "duty, deducible from the mere general analysis of the notion of rational or self-determining activity, and from this concept deduce in turn laws of conduct applicable without restriction to all rational or self-determining agents as such, irrespective of the special peculiarities of their physical environment and animal nature." In other words, he would not base ethics on metaphysics as Kant and his followers do. "Any really fruitful inquiry after an ethical ideal or ethical principles," he says, "must be based not merely on an analysis of the formal characteristics of moral action, but upon an examination of the actual circumstances of the material and social environment of the human race, or, in other words, that ethics must study man not merely as an intelligence, but as an animal dwelling on the surface of a particular planet under certain definite physical surroundings, and inheriting certain peculiar instincts, and as a member of a species having certain special ways of obtaining nourishment and of reproducing his kind. All attempts to create a universal system of ethical principles, applicable not only to mankind but to all intelligent and self-determining agents, must be mere waste of time."

In other words, ethics is from Mr. Taylor's point of view, "an empirical or natural study as much as physiology or psychology. But it does not follow from this that metaphysical philosophy and ethics have nothing to do with each other, or that there is no such thing as a 'Metaphysics of Ethics.' . . . Our complaint

against the metaphysical moralists is simply this, that they invert the real order of dependence between the two branches of inquiry, and make the 'Metaphysics of Ethics' the beginning, instead of the end, of an examination of morals."

In this practical manner and in seven chapters bearing the titles, "Metaphysical Ethic," "The Roots of Ethics," "The Types of Virtue," "Moral Ideals and Progress," "Pleasure, Duty, and the Good," "The Goal of Ethics," "Beyond Good and Bad," Mr. Taylor has considered the ethical problem under its most manifold aspects; and both his processes of reasoning and the results he has reached will be found deserving of careful attention. μ.

CHRISTIANITY AND MYTHOLOGY. By *John M. Robertson*. London: Watts & Co., 17 Johnson's Court, Fleet Street. 1900. Pages, xviii, 484. Price, 8s. 6d.

Mr. Robertson has given us in this work a comprehensive study of the origins of Christianity considered from a mythological point of view. A myth, according to him, is "simply a false hypothesis (whether framed in bad faith or in good faith) which once found easy credence; and when inadequate or illusory hypotheses find acceptance in our own time, we see exemplified at once the play of the myth-making faculty and that of the normal credulity on which it lives.

"Any 'explanation' which is but an *a priori* formula to account for an uncomprehended and unanalysed process of phenomena is a 'true myth' in so far as it finds utterance and acceptance. Some myths are less fortuitous, more purposive, than others; and a question might be raised as to whether there is not here a true psychological distinction. My answer is that we can never demonstrate the entire absence of purpose: it is always a question of degree; and it makes little scientific difference in our elucidation whether we impute more or less of ignorant good faith, provided we recognise variation. A quite primitive myth may have been a conscious fiction on the part of its first framer; but the credulity of its acceptors assimilated it in exactly the same way as others framed in better faith."

Mr. Robertson's studies are the outgrowth of fifteen years of inquiry. They "set out with a certain scientific principle and a certain historical purpose: the principle being that Christian Origins should be studied with constant precaution against the common assumption that all myths of action and doctrine *must* be mere accretions round the biography of a great teacher, broadly figured by 'the' Gospel Jesus; while the practical purpose was to exhibit 'The Rise of Christianity, Sociologically Considered.' To that end I was prepared to assume a primitive cult, arising in memory not of a great teacher but (perhaps) of an obscure thaumaturg, concerning whom there is preserved, in the Epistles of Paul, only the tradition of his crucifixion. But the first independent explorations, the first rigorous attempts to identify the first Jesuits, led to a series of fresh exposures of myth. 'Jesus of Nazareth' turned out to be a compound of an already composite Gospel Jesus, an interposed Jesus the Nazarite, and a superimposed Jesus born at Nazareth. And none of the three aspects equated with the primary Jesus of Paul. Each

in turn was, in Paul's words, 'another Jesus whom we have not preached.' And the Twelve Apostles were demonstrably mythical." When he was continuing his studies, he was gradually led to the concept of mythology as a more catholic science, or a more scientific classification of certain knowledge, than it had yet been shown to be in the hands of its cultivators, admirable as much of their work had been. He has set forth this view critically and historically in the opening treatise of the present volume, on the "Progress of Mythology," and has continued the research in a treatise on "Christ and Krishna," with a view of solving objectively and scientifically a simpler general problem in mythology and hierology. In the third part, he has considered successively from his special point of view the many Gospel myths. His conclusion is: "If our analysis of the Gospels as a congeries of myths be broadly accurate, there has been set up not merely a set of more or less sound and tested propositions in place of an aggregate of delusion, not merely a certain body of historic truth in place of much primitive error, but a sustaining and 'constructive' conception of human history in place of one profoundly destructive and dispiriting. The champions of the traditional view of the Gospels are the truly negative teachers: they insist to the last that the records represent either a supernatural or a supernormal exhibition of moral greatness; that it needed either a God or a man beyond all compare to give forth such teachings; they imply that only by such moral cataclysms has humanity ever been bettered; and they further imply that there is either no chance or little chance of comparable betterment in the future. It is such teaching as this that peculiarly deserves to be branded as perniciously negative, in that it negates the moral faculty of all mankind. To apply the phraseology of the Christians of past time, it is a blasphemy against Man. It has cast a glamour of mystery round some ancient portions of men's handicraft, and has so taught later men to despair of their own powers. If our 'negation' be just, it establishes the momentous affirmation that as Man is the maker of all Gods, so is he the maker of all Christs."

HINDU LOGIC AS PRESERVED IN CHINA AND JAPAN. By *Sadajiro Sugiura*. Edited by *Edgar A. Singer, Jr.* Published by the University of Pennsylvania. 1900. Pages, 114.

This monograph forms Number 4 of the "Series in Philosophy" publications of the University of Pennsylvania and is a dissertation offered by the author in partial fulfilment of the conditions for securing the degree of Doctor of Philosophy at that University.

Hindu logic, usually known as *Hetuvidya*, or the science of reasoning, has, since the introduction of Sanskrit literature into the West, excited a particular interest in connexion with Indian philosophies. The *Hetuvidya*, especially the new system of Mahâdinnâga, shows a great similarity to the Aristotelian formulæ of reasoning, and this fact has induced some scholars to think that the Indian invasion of Alexander the Great brought the Eastern syllogism into Greece, and that the

latter was elaborated by the Stagirite into the form we have at present. But the conjecture, which is in itself absolutely absurd from the fact that Alexander did not invade India until four years before Aristotle's death, is further slightly weakened by the circumstance that Mahâdinnâga lived seven hundred years after Aristotle. We may say that wherever there are analogous conditions intellectually or physically, we have always analogous results. But it may perhaps in the distant future fall to the lot of some learned scholar to prove laboriously that Mahâdinnâga may under the circumstances have owed something to Aristotle.

The author of the present pamphlet first reviews the six systems of Hindu philosophy in a brief introduction, beginning with the Sâmkhya school and ending with the Nyâya whose special pride lies in its important contribution to the development of Hindu dialectics. He then proceeds to the subject proper, first referring to the supposed founder of the *Hetuvidya*, whose name is known in the East as "Socmock" (Sokumoku = Akshapâda). We know absolutely nothing about his life; and like all the other ancient Indian thinkers, his date is veiled in obscurity. But the path first trodden by him was soon followed and improved by a number of Buddhist scholars. There must have been some other eminent logicians among other schools of philosophy besides Buddhism, but as the *Hetuvidya* is known in Japan and China only through Buddhist scholars, we are not in a position to ascertain what valuable contributions were made by Brahmans or Sâmkhyans. We can understand, however, through Buddhist literature, how prevalent the practical application of the principles of the *Hetuvidya* was among Indian thinkers, and with what vigor and sharpness one was engaged to prove or disprove a statement against the other. Following this example, Hindu logic is still diligently studied by Mahâyâna Buddhists in the far East.

Akshapâda's formula is called the "old system." The "new system" was formulated by Dinnâga, which is much simpler and more to the point than the old one. And this is the logic that constitutes the chief subject of investigation in the brochure before us. The documents utilised by the author are entirely in Japanese or in Chinese, and are generally inaccessible to Western scholars. The editor therefore has taken a very laudable step in bringing the present essay before the public.

The author has evidently worked under great difficulties to make the subject intelligible enough to English readers, and it remains for us but to congratulate him on his fair success. But if we may be allowed to point out a few shortcomings, trivial in character, yet irritating to those who are well acquainted with the subject, we should mention the following: The system of transliteration and pronunciation of Chinese characters is unwarrantable. We cannot see why the author has preferred the *Kwan* pronunciation (*Han* in Chinese) to the *Go* pronunciation (*Wu* in Chinese), while the latter method is almost exclusively used in the Buddhist and Hindu literature preserved in Japan. To take some examples from the text: *Muchak* (Sansk., *Asanga*, not *Asangha*) should be *Mu-jaku*; *Seish* (Sansk.,

Vasubandhu, not *Vasubhandu*) should be spelt *Seshin*; etc. But the importance of the subject-matter outweighs all these minor defects. T. S.

FRAGMENTS OF A FAITH FORGOTTEN. Some short sketches among the Gnostics mainly of the first two centuries,—a contribution to the study of Christian origins based on the most recently recovered materials. By *G. R. S. Mead, B. A., M. R. A. S.* London and Benares: Theosophical Publishing Society. 1900. Pages, xxviii, 630. Price, 10s. 6d. net.

The writing of the present work has been a congenial task to Mr. Mead, and he has brought to bear lovingly and zealously upon the portraiture of the figure of Christ and of early Christianity, all the knowledge which a deep study of Oriental religions from their emotional side could furnish. The book is published by the Theosophical Publishing Society, and bears of course the marks of its associations; but it may be stated at the outset that there is very little of what is commonly regarded as the Theosophic method apparent in the work, which is the product of a scholarly though withal very devotional spirit.

Mr. Mead's aim has been to enable the reader to obtain a glimpse of a world of which he has never heard at school, and of which no word is ever breathed from the pulpit; to take him away from the pictures which the rationalists and the apologists have presented, and to enable him to obtain an unimpeded view of that wonderful panorama of religious strife which the first two centuries of our era presented. He will here see "a religious world of immense activity, a vast upheaval "of thought and a strenuousness of religious endeavor to which the history of the "Western world gives no parallel. Thousands of schools and communities on "every hand, striving and contending, a vast freedom of thought, a mighty effort "to live the religious life. Here he finds innumerable points of contact with other "religions; he moves in an atmosphere of freedom of which he has previously had "no experience in Christian tradition. Who are all these people—not fishermen "and slaves and the poor and destitute, though those are striving too—but these "men of learning and ascetic life, saints and sages as much as many others to "whom the name has been given with far less reason?"

The task will be, the author says again, "to point to certain considerations "which may tend to restore the grand figure of the Great Teacher to its natural "environment in history and tradition, and disclose the intimate points of contact "which the true ideal of the Christian religion has with the one world-faith of the "most advanced souls of our common humanity,—in brief, to restore the teaching "of the Christ to its true spirit of universality. Not for one instant would we try "to lessen the reverence and the love of any single soul for that Great Soul "who watches over Christendom; our task will rather be to point to a soil in "which that love can flourish ever more abundantly, and ever more confidently "open its heart to the rational rays of the Spiritual Sun. That soil is rich enough "for the full growth of the man-plant; it is part of the original soil, and gives

"nourishment to every branch of man's nature, emotional and moral, rational and "spiritual."

In his endeavor to realise the object which he has set himself, Mr. Mead has traversed a vast field. Beginning with the Greece of 600 B. C., with its philosophies and mysticisms, with Egypt and its mysticism, with the systems of Philo, with the thought and civilisation of Jewry and Alexander, he considers general and Gnostic Christianity, the various sects of the Ebionites, the Essenes, the Ophites, etc., the individual doctrines and systems of Dositheus, Simon Magus, Menander, Saturninus, Marcion, Valentinus, etc., etc. We have then many pages devoted to traces of the Gnosis in the non-Canonical acts, to the Greek original works in Coptic translations, the Pistis Sophia, the book of the great Logos, the Akhmim Code, etc.; and finally, there is a bibliography. In fine, we have in this volume "a bird's eye view of the whole field of early Gnosticism," written for the general reader in a style and method requiring no knowledge of the ancient tongues, —all considered from a special point of view. It is designed as a pioneer sketch only, and the author hopes at some time in the future to be able to publish a large work comprising a number of volumes to be called *Round the Cradle of Christianity*. μ.

SCIENTIFIC ROMANCES. By *C. H. Hinton, B. A.* London: Swan Sonnenschein & Co., Ltd., Paternoster Square. Vol. I., 1886. Pages, 229. Price, 6s. Vol. II., 1896. Pages, 177. Price, 6s.

Mr. C. H. Hinton has kindly sent us his *Scientific Romances*,[1] in two volumes, published several years ago, and calls our special attention to his essays on the Fourth Dimension. We believe that space has infinite directions and that the assumption of three dimensions so called are nothing but the most economical way of determining space relations.[1] Systems of 4, 5, or *n* dimensions are abstractly conceivable, and their conception is useful to mathematicians as a generalisation which introduces a higher and more comprehensive point of view. There are difficulties and intricacies connected with the mathematical notion of a space system that presents a greater manifoldness than three dimensions, but for that reason the generalisation is legitimate for its purpose and within its limits as a generalisation, but if the idea of spaces of more than three dimensions is taken seriously, if they are thought as representing a reality, we venture into dreamland,—and it is a domain the possible form of which we cannot even conceive in our imagination.

Mr. Hinton's position may be characterised by the concluding paragraph of his essay on many dimensions. He says:

"There are two sides of religion,—the inductive and the deductive. To the realm of deduction belongs theology, with its central assertion and its manifold consequences. But inductive religion consists in grasping, amidst the puzzling

[1] See *Primer of Philosophy*, pp. 99–103. Compare *Fundamental Problems*, pp. 61–73.

facts of life, those greater existences in which the individual organisations are bound up, and which they serve, passing, as in every science, from the details to the whole. And the connecting link between materialism and the conduct of life, lies in the doctrine of the limited nature of our present space perceptions. For, with the elevation of our notion of space to its true place, the antagonism between our present materialistic and our present idealistic views of life falls away."

As to space he says:

"When in our space we have explained all that we can explain by the supposition of particles moving in our space, we shall find that there is a residuum, and this residuum will be explained by the four-dimensional movements of the minutest particles. The large movements are simply movements in three-dimensional space, but to explain the residual phenomenon a higher kind of space will be requisite."

And in another place he argues:

"If a fourth dimension exists, there are two possible alternatives.

"One is, that there being four dimensions, we have a three-dimensional existence only. The other is that we really have a four-dimensional existence, but are not conscious of it. If we are in three dimensions only, while there are really four dimensions, then we must be relatively to those beings who exist in four dimensions, as lines and planes are in relation to us. That is, we must be mere abstractions. In this case we must exist only in the mind of the being that conceives us, and our experience must be merely the thoughts of his mind,—a result which has apparently been arrived at, on independent grounds, by an idealist philosopher.

"The other alternative is, that we have a four-dimensional existence. In this case our proportions in it must be infinitely minute, or we should be conscious of them. If such be the case, it would probably be in the ultimate particles of matter that we should discover the fourth dimension, for in the ultimate particles the sizes in the three dimensions are very minute, and the magnitudes in all four dimensions would be comparable.

"The preceding two alternative suppositions are based on the hypothesis of the reality of four-dimensional existence, and must be conceived to hold good only on that hypothesis.

"It is somewhat curious to notice that we can thus conceive of an existence relative to which that which we enjoy must exist as a mere abstraction." P. C.

TALKS ON CIVICS. By *Henry Holt*. New York: The Macmillan Co. 1901. Pages, xxvi, 493. Price, $1.25.

Mr. Henry Holt has attempted in the present dialogues to rescue the method of Socrates and Plato from the nocuous desuetude into which it has fallen and to apply it to the resolution of the practical problems of politics and government now presenting themselves to the young voters of the United States. The aim he has set himself is "to develop in young people the character of mind which is proof against political quackery." "Of all our hard-bought institutions," he says, "there

is scarcely one, from a stable currency down to the very right of accumulating property, that has lately escaped a strong attempt to overthrow it, and to substitute for it some invention of the moment,—or rather some invention bearing a name of the moment, but being really a form of some protean error as old as history."

The point that Mr. Holt makes is that since all these political errors propose to get along faster than evolution, they are by their very nature impossible to a mind habitually recognising the law of evolution. Hitherto, but one or two American elementary text-books on civic subjects have sought in any way to emphasise the developmental character of institutions and forms of government, and so Mr. Holt's work has taken the shape of a deliberate "attempt to saturate young people's minds with the realisation that social institutions are evolutions, and therefore (1) that they can no more be modified by laws or votes or any other manifestations of human will than plants or animals can; but (2) that they *can* be modified *as much* as plants or animals can, though only by the same means,—careful study of their life-histories and habits, and cautious efforts in accordance with the improved conditions of their well-being; and (3) that they will be vitiated or destroyed by forced or ignorant treatment." This is the reason he has spent so much time over such topics as early land tenure, the nature of contracts, or, to use his own phraseology, over "the archæology of the subject." "I want to give the pupil," he says, "a consciousness that enduring institutions are growths, and do not spring up responsive to any magician's wand, be it in the hands of Mr. Altgeld, Mr. Bryan, or even so good a man as Henry George,—I want to accustom him, when any method is presented for his vote, to ask: Has this thing roots?" And above all he has sought to place before American youths at least one text-book "that should not claim that our constitutions—state and national—present the final word of human wisdom."

To accomplish his various purposes, Mr. Holt has spared neither pains nor space. The conversations are simply worked out, the illustrations which he has adduced are practical and pertinent; in the main, the arguments on both sides of the subject have been fairly and forcibly presented; and while the author's opinions on most economic and administrative subjects tend toward ultra-orthodoxy, his opposition is not unfraught with suggestiveness even to his opponents, and his liberal adoption and popularisation of the results of scientific economic research, not to speak of his comparative analyses of the best specimens of the institutions which foreign countries have to offer, will be of the highest value to all persons desirous of becoming thoroughly acquainted with the exigencies of present American politics. *μ.*

RECONSTRUCTION IN THEOLOGY. By *Henry Churchill King*, Professor of Theology in Oberlin Theological Seminary. New York: The Macmillan Co.; London: Macmillan & Co. 1901. Pages, xiii, 257. Price, $1.50.

The present work is a sincere and deeply religious attempt to reconstruct theology so as to bring it into closer conformity with the "changed intellectual, moral,

and spiritual world in which we live." The writer deems it possible "to avoid the great breach between the scholars of the Church and its membership, such as confronts Germany to-day." In the author's judgment, the result of all that modern science, inclusive of the theory of evolution, has done for theology is not revolutionary of anything that is vital to the highest Christianity, but tends rather to show a distinct trend toward a deeper appreciation of Christ's own point of view. It is with this purpose that special attention has been paid to the question of miracles, of the bearing of evolution on theology, and the influence of the historical and literary criticism of the Bible.

Professor King's position with regard to evolution is scarcely in harmony with what science teaches. The evolution of science he would call "evolution in its narrower scope." "A consistent view of evolution," he says, "must recognise the human stage, with its personal relations. We have no call to show that in these personal relations of men with men, or of God with men, all that occurs can be brought under the laws that hold on the lower stages." His attitude with respect to miracles is also not in accord with the view even of the advanced scientific school of theology represented by Pfleiderer, which excludes miracles in every sense of the word, nature-miracles as well as spirit-miracles. To Professor King the miracle is not the "isolated wonder" of Huxley. He says with Dr. Denison: "The miracles do not stand by themselves; they are profoundly significant; they "are a part of a vast and orderly spiritual movement, and those who have per- "ceived the significance and order of that movement, or who have experienced "even in a small degree its causation, have found in these things the strongest and "most rational evidence for a miraculous dispensation. It is true that this evi- "dence cannot be imparted by a brief process to a man destitute of spiritual per- "ception or experience, but that does not invalidate the rationality of the evidence; "it puts a premium just where it should be put, on spiritual culture."

We have made the foregoing quotations in order to characterise Professor King's attitude toward the important problems involved in the reconciliation of theology with science. While some truth will be found in the attitude of Professor King and Dr. Denison, it still remains the old point of view of Cardinal Newman, and leads logically to the espousal of the tenet of infallibility of the Church of Rome. The Protestant Church will, in our opinion, ultimately adopt, and be necessarily forced to adopt, the position of Pfleiderer. *μ.*

THE FIRST INTERPRETERS OF JESUS. By *George Holley Gilbert, Ph. D., D. D.* Professor of New Testament Literature and Interpretation in Chicago Theological Seminary. New York: The Macmillan Company. London: Macmillan & Co., Ltd. 1901. Pages, xiii, 429. Price, $1.25.

Proceeding on the assumption that the utterances of the first interpreters of Jesus, whose writings have been preserved in the New Testament, are vastly more important both as to the material they offer and the spirit in which they write than

those of any subsequent authors, Dr. Gilbert has set himself the task of ascertaining as accurately as possible "how Jesus and his revelation appeared to these men of the first century." He does not wish to place their interpretation before the Gospel itself, or to intimate that Christ, his life, death, and resurrection, is not infinitely more than any interpretation, even though it be apostolic and inspired; but he desires to get solely at the *facts* of the Christian scriptures, as distinguished from the peculiar points of view of the reporting authors. This task "is obviously historical," says Dr. Gilbert, "for it is nothing else than the investigation of a number of ancient Greek writings. The sole aim of the student who undertakes this task—and therefore our sole aim—is to learn the moral and religious views which these ancient Greek writings contain. It is not to defend these views. It is not to show their harmony or lack of harmony with the revelation of Jesus, or with the teaching of the Church in subsequent ages. The solitary question with which we here approach these documents is the question of fact—What do they teach?"

But, as we have intimated before, the emphasis is to be placed upon the facts taught, and not upon the point of view either of the original authors or of modern theology. "Our question is not," says the author, "What does John or Paul teach regarding God, or sin, or immortality, the Church, or the sacraments, or any other particular topic of religion or morals? If we had access to the living writers, we might take our theological categories along and ask them to give us their thought on the various subjects; but instead of the living writers we have some of their writings only, and we cannot assume that when they composed these they had in mind any of our mediæval or modern 'skeletons' of theology. We cannot hope, then, to do justice to any one of these writings if we go to it with a set of specific questions, and search out the words in it which bear upon this or that topic. A procedure of that kind is not interpretation, but is rather a violent attempt to make the New Testament authors think and speak according to our notions of Christian truth. This method is not historical."

The author has endeavored to accomplish his task in twenty brief chapters, nine of which are devoted to the teachings of Paul, five to the teachings of the minor writers, James, Peter, Jude, Hebrews, and the remaining chapters to the teachings of John and to the Apocalypse. The book, which is written from the purely orthodox point of view, has excellent indices. *μ.*

BIRTH A NEW CHANCE. By *Columbus Bradford.* Chicago: A. C. McClurg & Co. 1901. Pages, 363. Price, $1.50.

Some time ago the editor received from the author of this book the following letter:

"I write to call your attention personally to a book of which I am the author —*Birth a New Chance.* I think possibly it may be of special interest to you, inasmuch as it was first entitled *Whence and Whither?* and had to be changed because of your own work bearing that title having got on the market ahead of mine.

My publishers would not accept my title because of your book. I purchased and read your book as soon as I noticed the title. I like your treatment of the inquiry, for the most part. It is rather disappointing to find you stopping short of a hope of individual immortality. From my work you may possibly get a suggestion on which you may yet be able to found a hope of personal persistence beyond death.

"I think a copy was sent *The Monist*, and a review of it may ere this have appeared in that magazine. I think you would find my book sufficiently vivacious in style for even vacation reading. Kindly let me know if you will receive a personal copy and examine it as soon as convenient."

The book was duly received, and I found that it contains a peculiar and new conception of regeneration. The author ventures into fields where a man accustomed to the strict methods of science would not be apt to follow him; but his arguments are interesting, and the flight of his fancy is bold. No doubt his ambition to solve the problem is as keen as my own, and on going over his book I wish to represent his arguments with impartiality, the more so since I cannot accept his views. I believe that many of our readers will be glad to become acquainted with an author who does not walk in the beaten tracks. I limit myself strictly to quotations, which I hope will be a fairly good sketch of the author's belief.

Mr. Bradford says:

"The human race is a growing race, in process of rising from animalhood to angelhood.

"Whatever of a Paradise or Eden he may have had before his fall, he can never have any higher heaven than this earth till he quits dying.

"To live is to live, and to be dead is to be dead. When a human being consciously dwells in a vital organism, called a body, he is alive. When his body collapses and dissolves, he is dead, and remains dead till he lives again in a new, organised vital body.

"The human personality, whether called the soul or the spirit, does not go out of the body at death, but retreats within the body, back into the germ from which that body grew, and from which, provided the "deeds done in the body" were not such as to destroy its vitality, there is ground to infer that another body will grow.

"This germ, or seed, into which the soul retreats at death answers well to the Apostle Paul's metaphor (1 Cor. xv. 37) of the 'bare grain,' which, he declares, is the only part of the body that is buried that will be in the new body when the dead person lives again.

"But 'flesh and blood cannot inherit the kingdom of God;' that is, cannot evolve a spiritual body from the present natural body. So, at the 'last day,' 'in a moment, in the twinkling of an eye,' the dead shall be raised incorruptible, and the living shall be changed. But from all the examples furnished—those of Jesus, Lazarus, the daughter of Jairus, and the widow of Nain's son—we have reason to infer that there will be no dead at the last day except in well-preserved bodies.

"An individual lives again after death by being born again, and he is born again by virtue of having during his life maintained sympathetic connexions with his race. By deeds of kindness and mercy to his fellows, even on a small scale, he maintains this sympathetic connexion and comes under the operation of a law as unfailing as gravitation, which draws back the soul-seed of the dead man into the warm life-currents of the living race, and so assures his being born again.

"We live again, therefore, because of pity more than because of piety.

"Since no individual is wholly saved till he quits dying, there is no hope of individual salvation apart from race salvation.

"In this sense, all who die die unsaved.

"This race redemption from death is to come through a purification of our common hereditary stream. Hence the importance given in the Bible to a scheme of blood salvation. The perfection of the race on earth is to come by getting all its members so well born they will not need to die or be born any more. This is what Jesus called 'The Regeneration' (Matt. xix. 28; Mark x. 29, 30); Greek, *Palingenesia*, meaning, literally, 'the born-again era.'

"But, so far as we can observe, nothing material leaves the person when the breath ceases at his death. The matter of which he is composed will weigh precisely as much the moment after as the moment before his death. The material atom from which he grew goes back into the earth whence it came, and if the same individual ever has another corporeal existence there is strong ground for the inference that it will be a growth from the same seed he grew from before, and by virtue of the same agency,—reproduction.

"I recall a tradition concerning the historic Roger Williams which suggests one possible way, whether the actual way or not. It is stated that an apple-tree grew up at the head of the grave in which Mr. Williams was buried. Sometime in the after years this apple-tree was dug up, and it was discovered that the roots of the tree had played a kind of freak by following the course of the disintegrated body in the grave. A large root had formed in the trunk of the body, and then forked and followed the course of the two legs, So practically the whole body of Roger Williams had turned into the root of an apple-tree.

"The article relating this tradition was headed, 'Who ate Roger Williams?' It was scientifically assumed that many of the properties and particles of the body of Williams had entered into the apple-tree, and some of them into the apples that grew on the tree, and that therefore whoever had eaten those apples had, in a way, eaten Roger Williams. This, I say, suggests at least a possible way for the homo-seed to pass from a dead and decaying body, through the medium of the vegetable kingdom, into a living body of its own species.

"But if this illustration strikes you as too cannibalistic, there are several ways whereby a soul, sealed up in a mere germ, may pass into the life currents that flow through some living body, and thus take its first step towards a renewed conscious and corporeal existence. We need only to think of this life-germ, this precious

soul-seed, as having a strong natural affinity for living human bodies, and so being drawn to those bodies by invisible life forces, as soon as its former body becomes sufficiently dissolved to release it. In cases of cremation this seed is doubtless released at once into the atmosphere, and is free to enter immediately into the soil to which it is specially indigenous; that is, into some living human body. We are told that we are constantly receiving into our bodies living germs of various kinds, and it is natural to suppose that human germs may find admission with the others.

"During the life of the body the soul gives constant evidence of the possession of a native instinct to preserve its body. This is strong enough in times of great peril to inhibit the function of the objective faculties, and cause the soul to lift the body and carry it out of danger. If it can exert itself thus for the preservation of its body during life, we have reason to believe that it can and will exert itself in some way for the rehabilitation of its body after death. If it can convey a living body out of danger, it can surely carry the seed in which it dwells till it finds a matrix in which to rebuild its body.

"But even if it were without this instinct, and should become after death merely a passive seed in the earth, the constant commerce going on between the earth and living human bodies would guarantee sooner or later the entrance of that seed into some living human body. And once having entered a living body, the organic machinery of that body will assign it to its proper place.

"That normal and matured human bodies do carry such seeds in their loins we are certain, and to my mind it seems more likely that they emerge from the earth instinct with life and find their lodgment in living bodies than that they are originally formed in those bodies. We call the propagation of our species *re*-production, which means producing over again. If the seeds from which members of our race are now growing are formed for the first time in the loins of their progenitors, then we should speak of the production rather than of the *re*-production of the species.

"Let us now direct our attention to some of the sayings of Jesus which seem to be explicable on no other ground than that of this hypothesis, that when we die our only hope of living again is in being born again. In order to make sure of living again in this way we must during our present life maintain sympathetic connexion with our race by deeds of kindness, helpfulness, and loving service.

"Jesus said:

"'And I say unto you, make yourselves friends of the mammon of unrighteousness; that when ye fail, they may receive you into everlasting habitations.'

"Jesus seems here to aim at giving the philosophy of the operation of the law of helpfulness which he so often enjoined. The friends we make by a beneficent use of money are to have something to do in bringing about our immortality. It seems to be this way:

"By observing this law of helpfulness we maintain sympathetic connexion with our race, so that when we 'fail,'—that is, die and dissolve,—the sympathetic

connexion we have established will draw the 'bare grain' in which each of us resides back into the life currents of living men, and enable us to live again and again until we, with the rest of the human race, attain immortal and spiritual bodies,—'everlasting habitations,' or 'eternal tabernacles,' as the Revised Version renders it.

"This same principle Jesus makes the basis of the general judgment. Condemnation of the lost is based upon sins of omission rather than sins of commission, and sins against man rather than against God. The mere neglect to minister to one's suffering fellow-beings is sufficient to sever the sympathetic connexion on which one depends to get back into life, and so there is no recourse for such a one but to remain forever bodiless in 'outer darkness.' This is also the danger Jesus so often referred to as threatening the rich man, the danger by a selfish life of making it impossible ever to live again. 'How hardly shall they that are rich enter into the kingdom of heaven.' To enter into that kingdom Jesus told Nicodemus that it was necessary to be born again; and the severing of sympathetic connexion with one's race by a selfish life will make such a new birth impossible.

"As my working hypothesis, I have adopted this: That every individual member of the human race lives more than one lifetime in this world, beginning each lifetime in the same way,—by being born,—and ending each by dying; that each individual will continue to do this till he rises above the necessity of dying, or sinks below the possibility of living."

The author concludes his book with the following sentences:

"Let us teach men that spiritual living will produce concrete results in this present world,—that it will in a few generations destroy death. In other words, let us teach men that if they will live after the spirit rather than after the flesh, they shall in due time see on this very earth a literal fulfilment of the prophecy in Revelation xxi. 4:

"'And God shall wipe away all tears from their eyes; and there shall be no more death, neither sorrow, nor crying, neither shall there be any more pain: for the former things are passed away." P. C.

Die Wirkungen des Geistes und der Geister im nachapostolischen Zeitalter bis auf Irenäus. Von *Heinrich Weinel*, Lic. Theol., Dr. Phil. Freiburg i. B., Leipzig and Tübingen: Verlag von J. C. B. Mohr (Paul Siebeck). 1899. Pages, xii, 234.

The present volume is an investigation of an important feature of the early Christian congregations, viz., their belief in the operations of spirit and spirits. To the early Christians the idea that they had to struggle, not with men nor with worldly authorities, but with powerful spirits, was not an empty phrase but a most tremendous reality. They believed in the existence, not only of the kingdom of God, but also of a demoniacal empire, and the existence of evil spirits was fully proved to them by experience; for all error, all diseases, all heresies, all tempta-

tions, all sufferings, were simply the effects of spiritual causes. And they learned to battle against the prince of the world and his satanic helpers through their faith in Christ. Dr. Weinel, of Bonn, goes over the historical material, and describes the mental attitude of the early Christians and the various phenomena resulting therefrom. He discusses the speaking in tongues, the so-called *glossolalia*, ecstatic singing and praying, inspired authorship, miracles, the healing of diseases, the laying on of hands, spiritual audition, vision, and intuition, the effects of spiritual taste and touch, as well as other hyper-æsthetic conditions.

The reader might have expected the author to enter into a critical discussion of these pneumatic phenomena from the standpoint of modern therapeutics and psychology, but Dr. Weinel restricts himself to a purely historical treatment of the subject; he says that the phenomena discussed by him will excite the astonishment and interest of the reader by their strangeness and eccentricity, but will at the same time elicit his admiration and reverence on account of the powerful energy with which death, devil, and world are conquered. The task of treating the same subject from the standpoint of psychology, or even of utilising it for practical religious purposes, he declines as not lying within his sphere.

The book contains a great amount of interesting facts and shows good judgment and a mastery of the subject. P. C.

DIE METRISCHEN STÜCKE DES BUCHES JEREMIA. Reconstruiert von *Dr. Carl Heinrich Cornill*, Professor der Theologie an der Universität Breslau. Leipzig: J. C. Hinrichs'sche Buchhandlung. 1901. Pages, xiii, 40. Price, 1.50 M.

Professor Cornill, the editor of the prophet Jeremiah in the *Polychrome Bible*, was, when compiling the Hebrew text, under the impression that the *Polychrome Bible* should serve simply as a condensation of the present standpoint of Bible criticism for the use of laymen; and thus he removed only the most obvious mistakes, leaving untouched all passages which, though doubtful to the critic, could be tolerated for the ordinary needs of devotion. Noticing that the *Polychrome Bible* is not for the layman alone, but for the scholar, that it is intended to proclaim from the house-tops the results of scientific investigation, if they only be firmly established, he proposes to adjust the shortcomings of his text in the translation which is soon to appear, by adding a special sheet of text explanations. His manuscript was handed in long ago, and in the meantime several new investigations have appeared, among which Professor Duhm's work is not the least important; and so Professor Cornill deemed it wise and justifiable to publish the result of at least a part of his text criticism in the present collection of the metrical passages of the prophet. Hebrew scholars will be the more interested in it as Jeremiah will be utterly misunderstood if the text were understood to be prose; and a critical sifting of the Hebrew original with a special view to its metrical passages is apt to prove important results as to our judgment of the nature of the book and the char-

acter of its author. Thus, this collection of the Hebrew text revision of Jeremiah will be an important and indispensable addition to the Hebrew text edition of the Book of Jeremiah, especially to the author's edition of the *Polychrome Bible*. The layman who does not know Hebrew will not directly, but indirectly, be benefited by the results which can be drawn from an appreciation of the poetical spirit of this most sympathetic figure among the prophets. P. C.

PROCEEDINGS OF THE ARISTOTELIAN SOCIETY. Containing the papers read before the Society during the Twenty-Second Session, 1900–1901. London: Williams & Norgate. 1901. Pages, iv, 239. Price, 10s. 6d. net.

The papers of the Aristotelian Society have always been of interest from the point of view of technical philosophy, and many of them have contributed even to the definitive elucidation of metaphysical problems. They deserve, therefore, the attention of students, for whose benefit we here append a list of the titles: I. Presidential Address—The Common-Sense Conception of a Material Thing, by G. F. Stout; II. On the Aspect Theory of the Relation of Mind to Body, by E. C. Benecke; III. The Conceptions of Cause and Real Condition, by Shadworth H. Hodgson; IV. On Some of the Phenomena of Poetic Effectiveness, by E. H. Donkin; V. Art and Personality, by Henry Sturt; VI. The Substance-Attribute Conception in Philosophy, by Shadworth H. Hodgson; VII. Identity, by G. E. Moore; VIII. Italian Philosophy in the Nineteenth Century, with Special Reference to the Place of Francesco Bonatelli, by James Lindsay; IX. A Scientific Monism, by Arthur Boutwood; X. The Meaning of Sameness, by Miss E. E. Constance Jones; XI. The Pseudo-Science of Æsthetics, by Alexander J. Finberg; XII. The Theory of Subjective Activity, by H. Wildon Carr; XIII. The Belief in External Realities, by G. Dawes Hicks; XIV. The Conscious Being, by Shadworth H. Hodgson.

We could only wish that the price of the volume were less.

LA SÉRIE DE TAYLOR ET SON PROLONGEMENT ANALYTIQUE. Par *Jacques Hadamard*. Paris: C. Naud. 1901. Pp., 100. Price, 2 francs.

PRODUCTION ET EMPLOI DES COURANTS ALTERNATIFS. Par *L. Barbillion*. Paris: C. Naud. 1901. Pp., 103. Price, 2 francs.

These two little volumes, neatly and æsthetically bound in flexible covers, are the May issues of *Scientia*, a serial publication edited by some of the foremost *savants* of France and devoted to the systematic philosophical consideration of the scientific questions of the day, as distinguished from the fragmentary and specialised treatment which they are accorded in the technical periodicals. For instance, M. Hadamard in six chapters, to each of which he has supplied an exhaustive bibliography, has considered all the new researches that have been made in connexion with that powerful engine of modern analysis, Taylor's Series, and with its application to the discovery of analytic functions constituting the solution of

such problems as the integration of algebraic differential equations. And M. Barbillion has performed a similar task on the physical side for alternating currents. Both essays are masterful expositions, and in so far as the difficult mathematical nature of their respective subjects permits, they are simply and lucidly written. They harmonise, in fine, with the general character of excellence of this series, to which the most widespread attention should be called.

AMERICAN DIPLOMATIC QUESTIONS. By *John B. Henderson, Jr.* New York: The Macmillan Company. London: Macmillan & Co., Ltd. 1901. Pages, ix, 529. Price, 10s. 6d.

This large volume, without preface, statement of purpose, or index, is a collection of essays upon the principal diplomatic questions which have occupied the attention of American statesmen and publicists. Five great questions have been exhaustively considered: I. The Fur Seals and Bering Sea Award; II. The Interoceanic Canal Problem; III. The United States and Samoa; IV. The Monroe Doctrine; V. The Northeast Coast Fisheries. Persons desirous of acquainting themselves thoroughly with these important chapters of American diplomatic history, many of which have still a present interest, will find Mr. Henderson's volume in every respect a satisfactory one.

KLASSICISMUS UND NATURALISMUS BEI FR. TH. VISCHER. Von *Erich Heyfelder*. Berlin: R. Gaertners Verlagsbuchhandlung. Hermann Heyfelder. 1901. Pages, 86.

This little pamphlet, which is devoted to a consideration of the intellectual development of Fr. Th. Vischer, the great German æsthetician, is, in addition, a concise appreciative sketch of the entire æsthetic philosophy of Germany, from Kant to the latest times. The author does not omit even to connect his reflexions with the ancient systems, so that the brochure will be found altogether to make a very interesting reading in the history and theory of art.